PB85-249597

Superfund Record of Decision (EPA Region 3) Taylor Borough Site Lackawanna County, Pennsylvania, June 1985

(U.S.) Environmental Protection Agency
Washington, DC

28 Jun 85

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Emergency and
Remedial Response

EPA/ROD/R03-85/013
June 1985

PB85-249597

EPA

Superfund Record of Decision:

Taylor Borough, PA

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16. ABSTRACT

The Taylor Borough site is located at the toe of Bald Mountain, approximately three miles south of the City of Scranton. The population within a one mile radius of the site is estimated to be 1,007 persons with approximately 265 residential dwellings. The site is situated within a tract of land that was previously coal mined and left unreclaimed with numerous open and surface mine spoil pits. Subsequent to the mining activities, unreclaimed portions of the 125-acre site were used for a municipal landfill operation by the City of Scranton. Municipal waste was disposed in the pits and the mine spoil material was used as a cover material. As a result of the landfill operation, which ceased in 1968, the topography of the site consists of relatively rolling terrain between steep slopes of mine spoil piles and unreclaimed pits. In addition, after the landfill operation ceased, drummed industrial wastes were found on the surface of the site.

The selected remedial action includes: removal and off-site disposal of approximately 125 crushed and intact drums and remnants to a qualifying RCRA facility; collection and treatment of contaminated surface water; excavation of contaminated soils and wastes from the former drum storage areas for off-site disposal to a qualified RCRA facility; proper backfilling and placement of a 24-inch soil cover over the former drum storage areas and installation of a chain link fence around the perimeter of both soil covered areas. Total capital cost is estimated to be $4,237,000.

17. KEY WORDS AND DOCUMENT ANALYSIS		
a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Record of Decision Taylor Borough, PA Contaminated Media: soil, sw, air Key contaminants: Benzene, toluene, phtalate acid esters, polycyclic aromatic hydrocarbons, trichloroethylene, chloroform and other organic chemicals		
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RECORD OF DECISION
REMEDIAL ALTERNATIVE SELECTION

Site: Taylor Borough Site, Lackawanna County, Pennsylvania

Documents Reviewed:

I am basing my decision principally on the following documents describing the analysis of cost effectiveness and feasibility of remedial alternatives for the Taylor Borough Site. Unless otherwise specified, the underlying technical information is included in these reports:

- "Feasibility Study Report", (Draft), Taylor Borough Site, Lackawanna County, Pennsylvania, (NUS Corp. May, 1985)
- "Remedial Investigation Report", (Draft), Taylor Borough Site, Lackawanna County, Pennsylvania, (NUS Corp. May, 1985)
- "Work Plan", Remedial Investigation/Feasibility Study of Alternatives, Taylor Borough Site (NUS Corp. February, 1984)
- "Remedial Action Master Plan", Taylor Borough Site, (NUS Corp./Phoenix Safety Association LTD. September, 1983)
- Summary of Remedial Alternative Selection
- Recommendations by the Pennsylvania Department of Environmental Resources
- Staff summaries and recommendations, including these attached

Description of the Selected Remedy:

- Removal and off-site disposal to a qualifying facility under the Resource Conservation and Recovery Act (RCRA) 40 C.F.R. Part 264, Subpart N of approximately 125 crushed and intact drums and remnants remaining on the surface or partially buried.
- Collection and treatment of contaminated surface water in Ponds 1 and 2.
- Excavation of contaminated soils and wastes from former Drum Storage Areas Nos. 1 and 2 and sediments in Ponds Nos. 1 and 2 for off-site disposal to a qualified RCRA facility.
- Proper backfilling and placement of a 24 inch soil cover over: (a) former drum storage areas 3 and 6 and the entire area in between, and (b) former drum storage area 4. Installation of a chain link fence around the perimeter of both soil covered areas.

Declarations

Consistent with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) and the National Contingency Plan (40 C.F.R. Part 300), I have determined that the remedial actions described above together with proper operation and maintenance constitute a cost-effective remedy which mitigates and minimizes damage to public health, welfare, and the environment. The remedial action will be designed to minimize the risk of potential evacuation and temporary inconveniences to the local environment during the excavation and transportation phases.

The State of Pennsylvania has been consulted and agrees with the approved remedy. Following placement and installation of the soil cover and fence at the locations identified in the "Summary of Remedial Alternative Selection," operation and maintenance activities will be required to ensure the continued effectiveness and level of protection of the remedy. These activities will be considered part of the approved action and eligible for Trust Fund monies for a period of one year. Land use restrictions may also be necessary to ensure the effectiveness of the remedy.

In addition, the off-site disposal of contamined soil, sediment, and wastes to a secure hazardous waste facility is necessary to protect public health, welfare and the environment.

I am deferring selection of remedial response measures, if any, for groundwater contamination. Further assessment of the nature of detected contamination and the appropriate RCRA measures to address such contamination will be performed.

I have determined that the action being taken is appropriate when balanced against the availability of Trust Fund monies for use at other sites.

6/28/85
Date

James M. Seif
Regional Administrator
EPA Region III

Summary of Remedial Alternative Selection
Taylor Borough Site

Site Location and Description

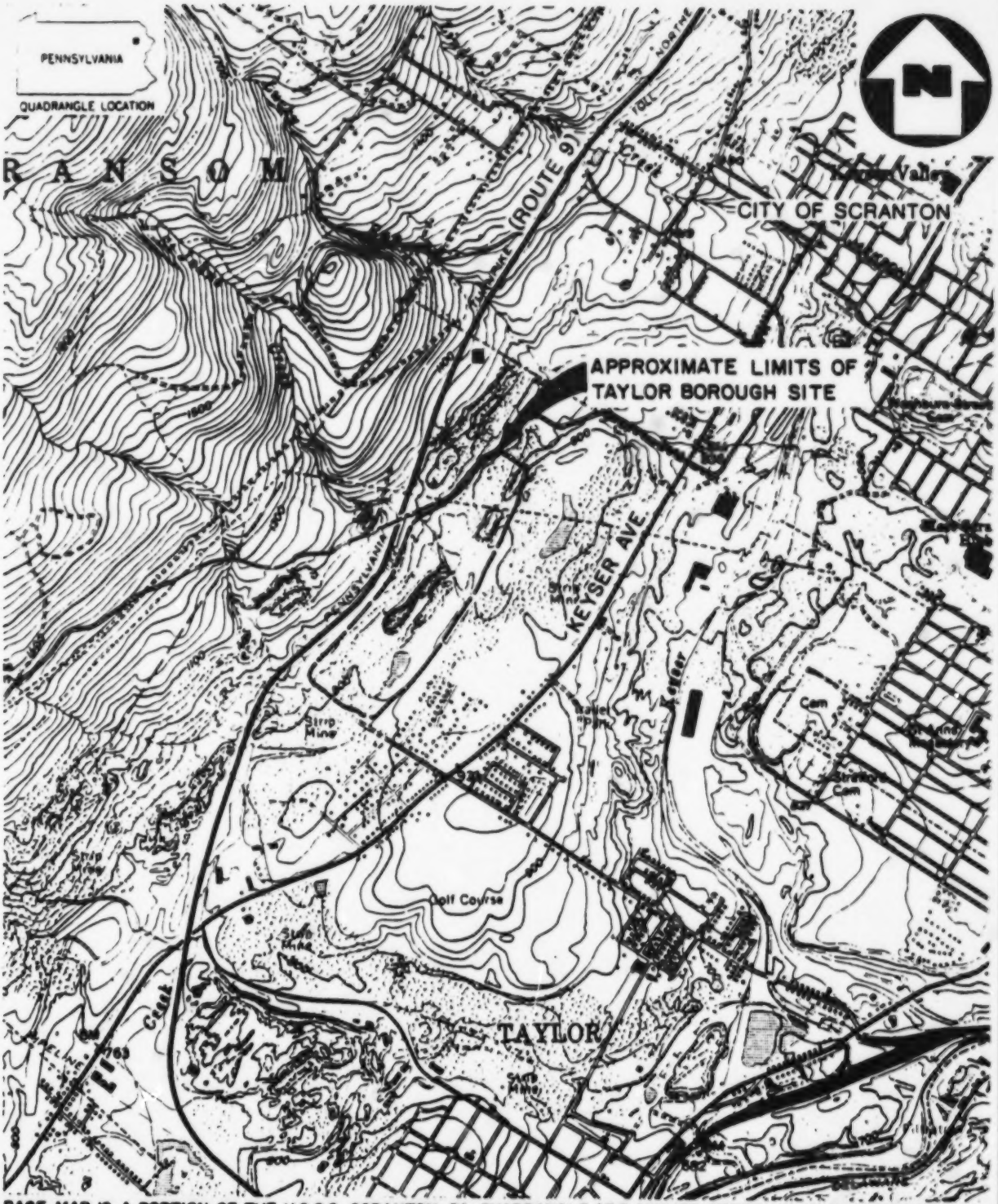
The Taylor Borough Site is aligned in a northeast-southwest direction in Taylor Borough, Lackawanna County, Pennsylvania (figure 1). It is situated at the toe of Bald Mountain about 3 miles south of the City of Scranton. The Northeast Extension of the Pennsylvania Turnpike is the Northwest limit of the site. A recreational area, McDade Park, and a County maintenance building and property bound the site on the northeast. Abandoned strip mine operations, waterfilled depressions, and spoil piles bound the site on the southeast. A new residential development and the inactive Bichler municipal landfill bound the site on the southwest (figure 2).

The Taylor Borough site is situated within a tract of land previously mined (both underground and strip). The strip mine operations, which extended beyond the limits of the site, left the area unreclaimed with numerous open pits and surface mine spoil piles. Subsequent to the mining activities, unreclaimed portions of the 125 acre site were used for a municipal landfill operation by the City of Scranton. Municipal waste was disposed in the pits and the mine spoil material was used as a minimal (0-2 feet) cover material. As a result of the landfill operation, which ceased in 1968, the topography of the site consists of relatively rolling terrain between steep slopes of mine spoil piles and unreclaimed pits.

Based on the 1980 census, approximately 75 percent of the populations of Scranton (88,117) and Old Forge (9,304), and all of the population of Taylor Borough (7,246) live within a five mile radius of the site. The population within a one mile radius of the site is about 1,007 persons with approximately 265 residential dwellings. With the exception of the new residential development located at the southeastern border of the site, there has been no residential or commercial development within 1,400 feet of the identified site limits. Onsite observations indicate the site has been used particularly by children as a place to play, bike ride, walk through to McDade Park, and as a target practice area for hunters or other gun owners.

St. John's Creek, with head waters on Bald Mountain, is an intermittent stream which flows through the site and eventually discharges into the Lackawanna River. During the strip mine operations, the creek bed had been relocated within the site limits onto strip mine spoil fill. As a result, the flow frequently disappears into the creek bed at certain points and reappears at other points during relatively low flow periods.

As a result of the mining and landfill operations, subsidence and settlement have developed depressions on the surface which act as seasonal ponds. Precipitation and surface runoff collect in these areas and depending on the type of cover (soil and rock matrix) present, the water either ponds or infiltrates into the subsurface. Several small ponds which store water throughout the year are located approximately 100 feet east of the site. These ponds have been used by the adjacent property owner for recreational purposes. Due to the present surface grading, these ponds do not receive surface runoff from the site.



BASE MAP IS A PORTION OF THE U.S.G.S. SCRANTON, PA QUADRANGLE (7.5 MINUTE SERIES, 1947, PHOTOREVISED 196[illegible] AND 1976). CONTOUR INTERVAL 20'.

FIGURE 1

LOCATION AND VICINITY MAPS
TAYLOR BOROUGH SITE, TAYLOR BOROUGH, PA

SCALE: 1" = 2000'

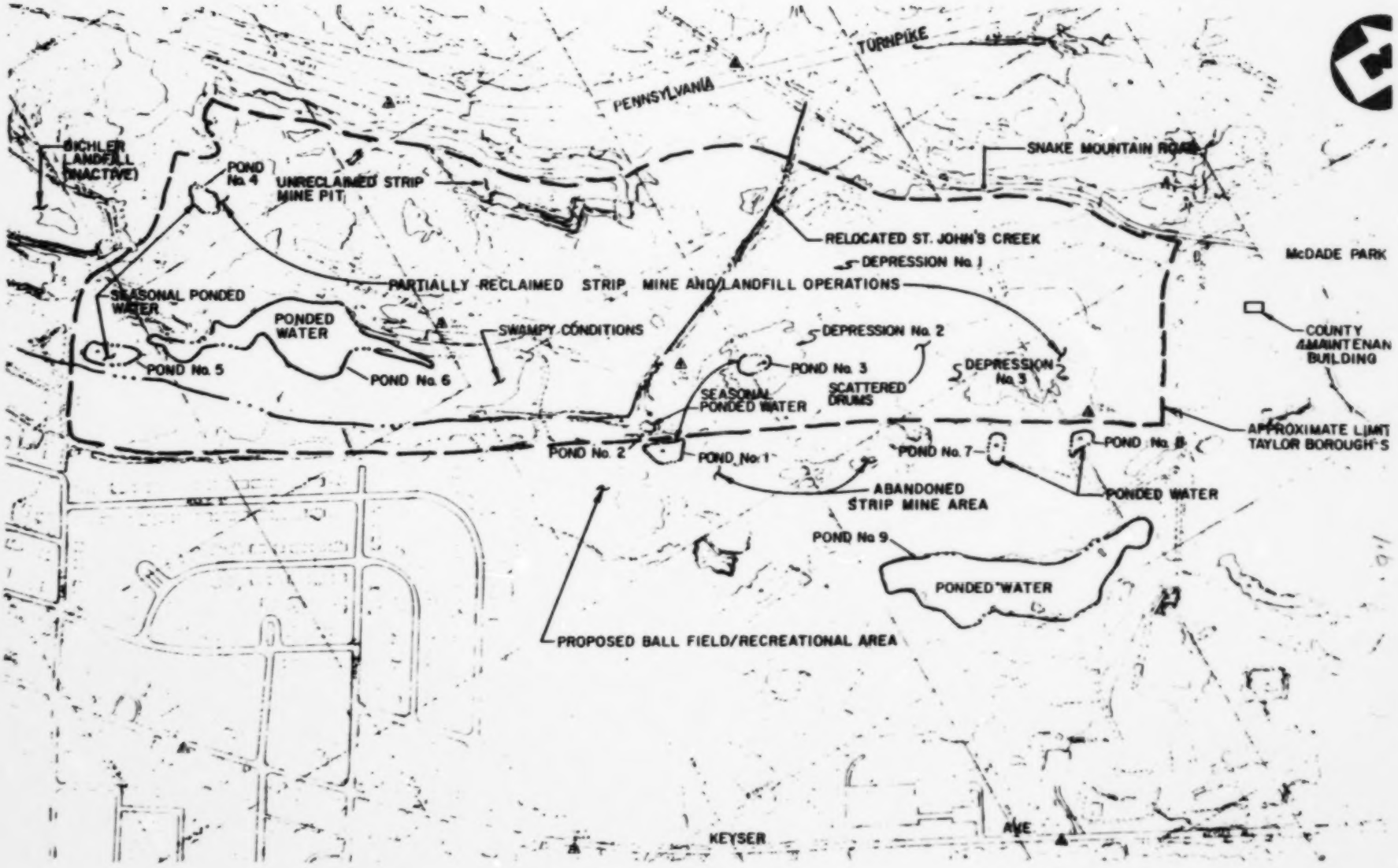


FIGURE 2

EXISTING CONDITIONS
TAYLOR BOROUGH SITE, TAYLOR BOROUGH, PA
SCALE AS SHOWN

400 0 400
SCALE IN FEET

Potable water for the Scranton-Wilkes Barre area is provided by a municipal surface water reservoir system. Neither the Campbell Lodge Reservoir (approximately 5 miles southwest of the site) or Lake Scranton (approximately 4.5 miles southeast of the site) receive surface water runoff from the site. There is no reported use of ground water for drinking purposes within one mile of the site.

Due to the extensive mining in Lackawanna County (strip and underground), the ground water aquifers closest to the surface in the valley have been significantly affected both in quality and yield. Bedrock beneath the site has naturally-occurring fractures; however, resultant mine voids have caused further rock fracturing and subsidence which has impacted ground water flow patterns. Unconsolidated soil deposits have been disturbed through surface mining operations. As a result, the hydrologic characteristics of the surface area, particularly the recharge of ground water aquifers has been substantially altered.

Site History

The Lackawanna Valley has historically been extensively mined for anthracite coal. Following the mining operations, the City of Scranton used the unreclaimed strip mine pits as a municipal landfill at least from 1967 through 1968. Records from the Pennsylvania Department of Environmental Resources (PADER) also document the disposal of industrial wastes. After the landfill operation ceased, drummed industrial wastes were found on the surface of the site.

Beginning in 1981, Environmental Protection Agency (EPA) and the PADER conducted various field inspections of the site. The majority of the surface drums were concentrated in six areas (figure 3). Most of the drums were open and the contents may have spilled during the dumping. Many had also been punctured by bullet holes. Air sampling close to the drums identified the presence of volatile organics. Drum and drum spill samples were analyzed in 1982 and found to contain benzene, toluene and other substituted benzenes, phthalate acid esters, polycyclic aromatic hydrocarbons, trichloroethylene, chloroform and other organic chemicals.

On September 11 through 12, 1983, a fire occurred on the surface of the landfill. It appears mine spoil was pushed over burning areas to extinguish the fire. As a result, some drums were partially buried. Since the fire had engulfed several drums, it prompted EPA to institute an Immediate Removal. During September through November of 1983, approximately 1,200 drums were removed from the site.

The initial Hazard Ranking System (HRS) score for the site 27.32. After additional documentation from the PADER indicating larger quantities of potentially hazardous substances had been dumped at the site, the HRS score was revised. The incorporation of this additional information resulted in a revised score of 30.94. After the site had been proposed for placement on the National Priorities List, authorization to proceed with a Remedial Investigation/Feasibility Study was approved in November, 1983. A work plan was developed which identified the following data needs:

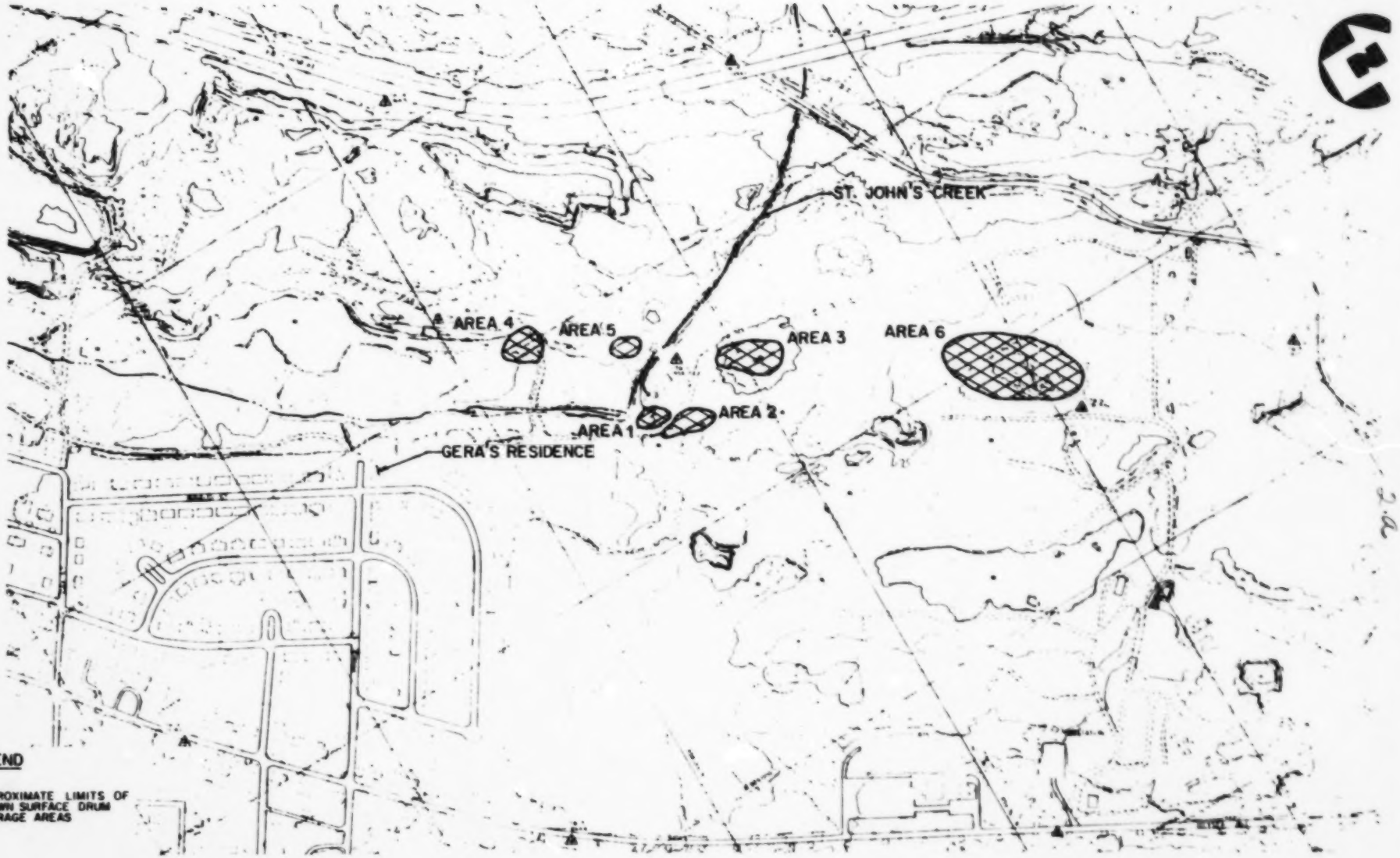


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FIGURE 3

SURFACE DRUMS STORAGE AREAS
TAYLOR BOROUGH SITE, TAYLOR BOROUGH, PA
SCALE AS SHOWN

* Drummed wastes were spilled on the surface of the site as indicated by previous sampling. Surface soil sampling was required to determine the nature and extent of contamination remaining in areas where field observations indicated the presence of isolated, crushed surface drums.

* No ground water data was available. Monitoring wells were needed to determine the presence and migration of possible bulk or drummed wastes buried within the landfill operations which might be affecting the ground water regime.

* Surface waters on and offsite needed to be sampled to determine the nature and extent of contamination and to monitor possible migration of contaminants.

A Remedial Investigation/Feasibility Study was funded at a total cost of $606,625 and field work began March, 1984.

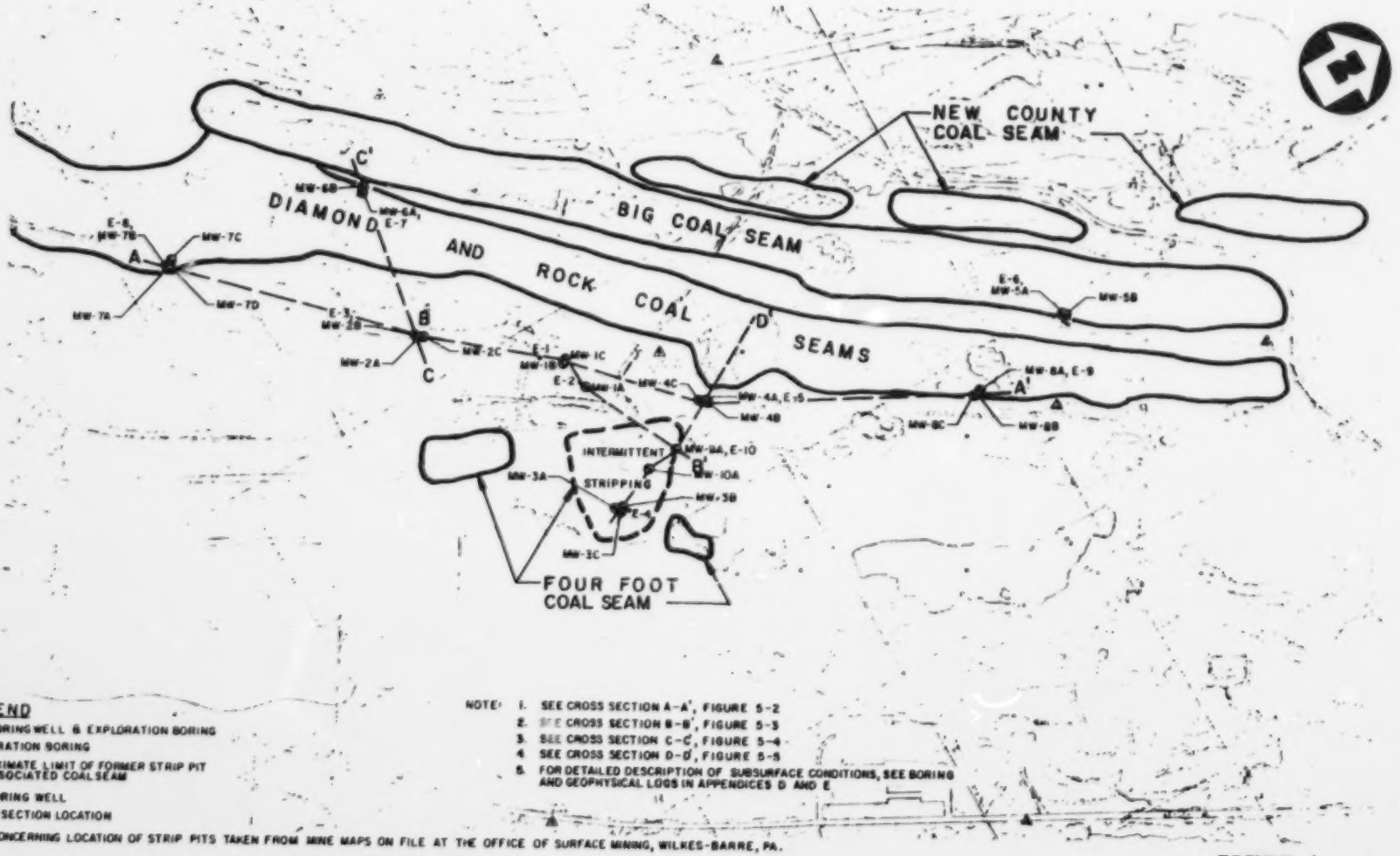
Current Site Status

Geophysical surveys were conducted during the Remedial Investigation to aid in determining the limits of the strip mine pits and the possible occurrence of buried drums. An Electromagnetic Conductivity (EM) Survey coupled with a review of available mining information identified the strip mine pits (figure 4). The EM Survey also estimated that trash and debris is extensive and occurs to depths of up to 25 feet in the pits. Below the trash and debris is a layer of mine spoil fill ranging from 25 to 75 feet from the bottom of the trash and debris to the base of the strip pits.

A Magnetometer Survey was performed to delineate areas underlain by ferromagnetic material. Results from this survey indicated significant amounts of buried ferromagnetic materials. In an effort to determine the type of material buried, nine test pits were excavated to a depth of nine feet in a large grid area which exhibited extensive anomalies (above background levels of buried ferromagnetic materials). No drums were encountered, only typical municipal landfill metal objects. Other smaller grid areas exhibited similar anomalies. Due to the possible interference of crushed barrels and other ferromagnetic debris on the surface of these areas coupled with the results of the first test pit program, it was decided not to expand the test pit program for the purpose of identifying other site anomalies.

Beneath the site, at least eight underground coal seams exist in the bedrock and have been extensively mined (figure 5). Based on subsurface investigations performed during the RI, the following coal seams and average thicknesses have been identified:

Coal Seam	Average Thickness (feet)
Diamond	5
Rock	6
Big	11
New County	4



LEGEND

- MW-5A,E-6 MONITORING WELL & EXPLORATION BORING
- E-1 EXPLORATION BORING
- APPROXIMATE LIMIT OF FORMER STRIP PIT OF ASSOCIATED COAL SEAM
- MW-8 MONITORING WELL
- A A' CROSS SECTION LOCATION

NOTE: INFORMATION CONCERNING LOCATION OF STRIP PITS TAKEN FROM MINE MAPS ON FILE AT THE OFFICE OF SURFACE MINING, WILKES-BARRE, PA.

NOTE:
1. SEE CROSS SECTION A-A', FIGURE 5-2
2. SEE CROSS SECTION B-B', FIGURE 5-3
3. SEE CROSS SECTION C-C', FIGURE 5-4
4. SEE CROSS SECTION D-D', FIGURE 5-5
5. FOR DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS, SEE BORING AND GEOPHYSICAL LOGS IN APPENDICES D AND E

FIGURE 4

STRIP MINE PITS,
MONITORING WELL LOCATIONS/CROSS SECTIONS A-A' THROUGH D-D'
TAYLOR BOROUGH SITE, TAYLOR BOROUGH, PA

SCALE AS SHOWN

400 0 400
SCALE IN FEET

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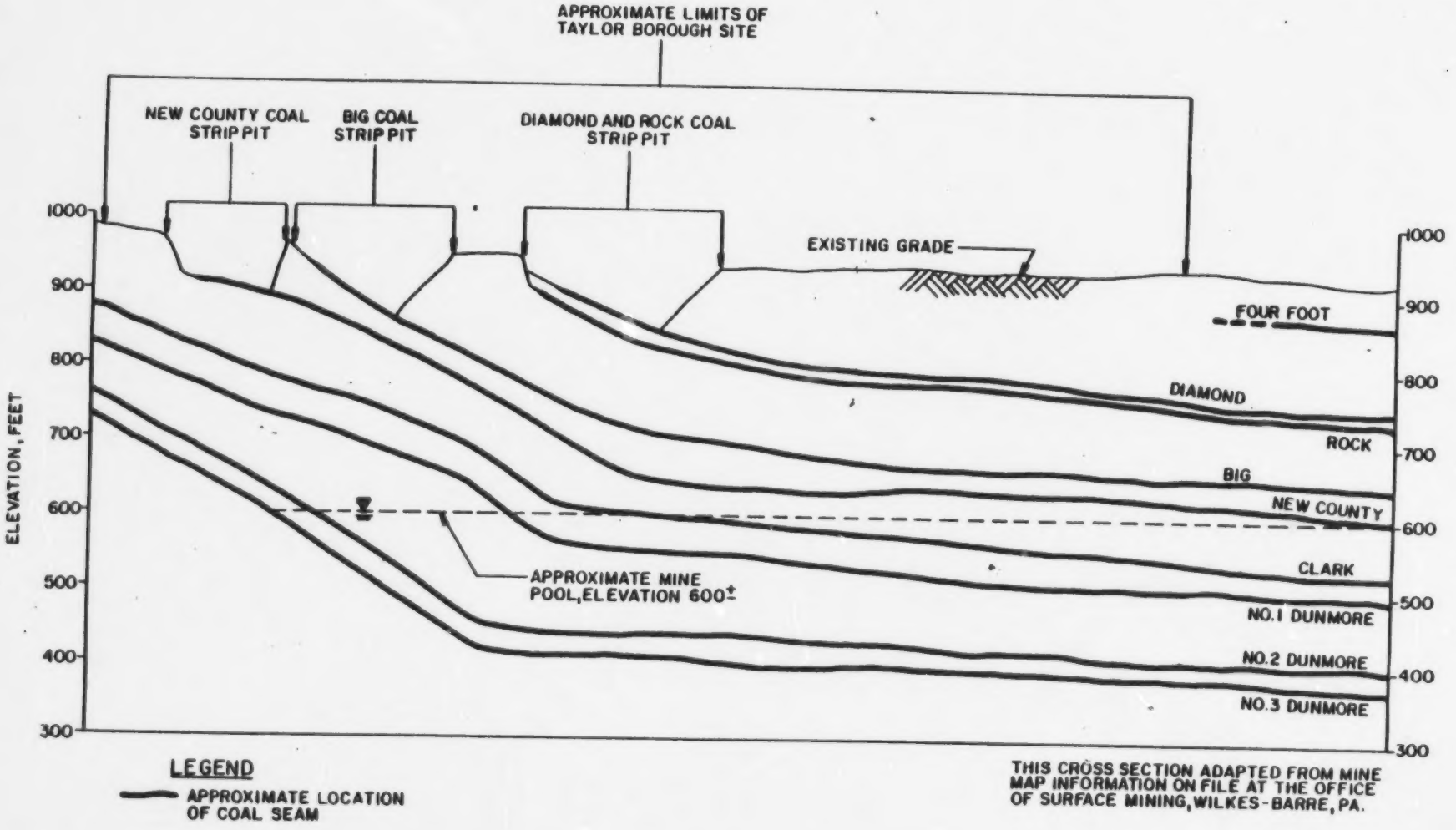


FIGURE 5

GENERALIZED GEOLOGIC CROSS SECTION
TAYLOR BOROUGH SITE, TAYLOR BOROUGH, PA

SCALE: 1" = 200'

Coal Seam	Average Thickness (Feet)
Clark	3
Dunmore No. 1	3
Dunmore No. 2	3
Dunmore No. 3	4

These seams have had at least 50 percent of the coal mined (Singer 1975).

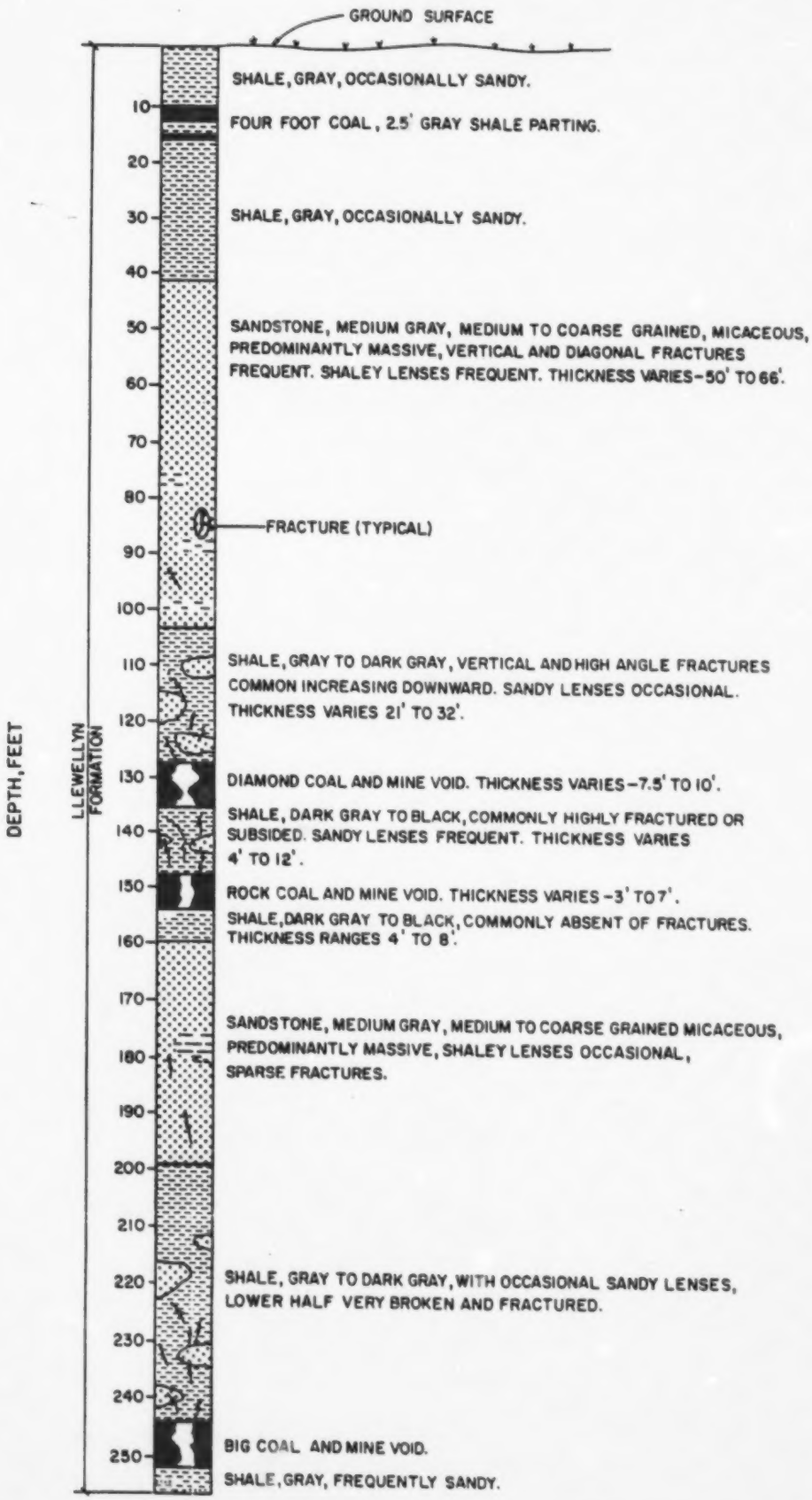
Bedrock stratigraphy as determined from drilling and borehole geophysics is summarized in figure 6. Naturally existing fractures and fracturing due to the mining operation have had a substantial impact on the ground water hydrology. Major aquifers that may have existed prior to mining have been dewatered. Perched water zones exist within the shallow unconsolidated deposits in the site area, however, yields are generally less than 1 gallon per minute. The water in these zones is controlled by (a) the presence of low-permeability till deposits and (b) the uncontrolled deposit of strip mine spoil that contains varying quantities of clay and silt materials. Based on the above, no continuous ground water level is present across the site.

Structural geology and subsurface drilling information has indicated at least five distinct water-bearing zones that were monitored in the bedrock. These zones are perched on unfractured shale units. Water in these zones flows to a vast mine pool either by vertically migrating through fractured rock and mine openings (air shafts, slope openings, unsealed boreholes) or by following geologic structure and intercepting the mine pool at an elevation of approximately 600 feet above mean sea level. Within the vicinity of the site, vertical distance from the site surface to the mine pool ranges between 300 and 350 feet.

The mine pool water is not a potential source of drinking water. Based on the Ground Water Protection Strategy categories, the mine pool is considered a Class 3 aquifer due to contamination from mine drainage. Laboratory analyses indicate its quality as having high levels of dissolved metals and ionic constituents (Feasibility Study Report, Lackawanna Site, February, 1985).

The site is an abandoned municipal landfill located in a reclaimed strip mine operation. Certain waste characteristics identified could be reflective of either of these activities as well as unpermitted disposal. In an attempt to segregate these contaminations from the contaminants related to the industrial waste disposal, a literature search was performed to identify documented data relating to typical landfill and anthracite coal/spoil characteristics. A detailed discussion of the remedial investigation sampling results is described below.

NOTE: THIS COLUMN COMPILED FROM LOGS OF TEST BORINGS, MONITORING WELLS AND BOREHOLE GEOPHYSICS. LITHOLOGIES AND DESCRIPTIONS ARE A SUMMARY OF THE SEQUENCES ENCOUNTERED AND ARE AVERAGED WHERE NECESSARY.


GROUND SURFACE
SHALE, GRAY, OCCASIONALLY SANDY.
FOUR FOOT COAL, 2.5' GRAY SHALE PARTING.
SHALE, GRAY, OCCASIONALLY SANDY.
SANDSTONE, MEDIUM GRAY, MEDIUM TO COARSE GRAINED, MICACEOUS, PREDOMINANTLY MASSIVE, VERTICAL AND DIAGONAL FRACTURES FREQUENT. SHALEY LENSES FREQUENT. THICKNESS VARIES-50' TO 66'.
FRACTURE (TYPICAL)
SHALE, GRAY TO DARK GRAY, VERTICAL AND HIGH ANGLE FRACTURES COMMON INCREASING DOWNWARD. SANDY LENSES OCCASIONAL. THICKNESS VARIES 21' TO 32'.
DIAMOND COAL AND MINE VOID. THICKNESS VARIES-7.5' TO 10'.
SHALE, DARK GRAY TO BLACK, COMMONLY HIGHLY FRACTURED OR SUBSIDED. SANDY LENSES FREQUENT. THICKNESS VARIES 4' TO 12'.
ROCK COAL AND MINE VOID. THICKNESS VARIES -3' TO 7'.
SHALE, DARK GRAY TO BLACK, COMMONLY ABSENT OF FRACTURES. THICKNESS RANGES 4' TO 8'.
SANDSTONE, MEDIUM GRAY, MEDIUM TO COARSE GRAINED MICACEOUS, PREDOMINANTLY MASSIVE, SHALEY LENSES OCCASIONAL, SPARSE FRACTURES.
SHALE, GRAY TO DARK GRAY, WITH OCCASIONAL SANDY LENSES, LOWER HALF VERY BROKEN AND FRACTURED.
BIG COAL AND MINE VOID.
SHALE, GRAY, FREQUENTLY SANDY.
10
20
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110
120
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190
200
210
220
230
240
250
DEPTH, FEET
LLEWELLYN FORMATION

FIGURE 6

Air surveys, using direct-reading volatile hydrocarbon detectors, were conducted during all field activities to detect volatile hydrocarbons. Each area where drums had been located was inspected and scanned. There were no readings above background in any of the areas. At various times during field visits to the site, a sweet chemical-like aroma would be detected in the vicinity of Pond No. 1. The occurrence of the aroma was transient and seemed to be emanating from the surface soils, water, or mud adjacent to the pond. This organic vapor could not be detected on the direct reading instrumentation. Based on its persistence, EPA decided to perform a second test pit program in an effort to identify the source and extent of contamination.

Eleven test pits were excavated adjacent to Ponds 1 and 2 and soil samples at different depths were screened by gas chromatography for a selection of samples to be sent to the Contract Laboratory Program for Hazardous Substances List analysis. The screening showed tetrachloroethylene and/or toluene in eight out of thirteen samples and methylene chloride in all thirteen samples. Full analyses also indicated the presence of methylene chloride in all samples. One test pit sample contained several other commonly used industrial solvents including ethylbenzene, toluene, xylene and 4-methyl-2-pentanone. Bis(2-ethyl hexyl) phthalate and PCB-1254 were also present. Another test pit sample contained numerous polynuclear aromatic hydrocarbons as well as PCB-1254 (see Table 1).

A comparison of test pit inorganic results with background surface soil samples shows one test pit to have elevated levels of chromium, copper, lead, mercury, tin and zinc. Other test pit samples showed isolated instances of higher than background surface soil metal concentrations, but no test pit (other than TP20) had more than one metal above background (reference pg. 3-18 versus pg. 3-22 of "Remedial Investigation Report", Taylor Borough Site, NUS Corp., May, 1985).

A total of 17 surface water and sediment samples were collected and analyzed. Inorganic surface water results from onsite and offsite ponds and St. John's creek were within EPA Primary Drinking Water Standards. Concentrations of metals in all sediment samples (including downstream samples) were similar when compared to a background (upstream) sample in St. John's Creek.

Organic contamination of surface water and sediment samples was found to be localized in Pond 1 and 2. Samples taken from these two ponds showed similar organic constituents when compared to the test pit samples (12D and 13E) from the adjacent former drum storage area. These ponds and sediment are probably receiving runoff and occasional leachate from the former drum storage areas during periods of high rainfall.

TABLE 1

TEST PIT ORGANIC RESULTS - MARCH 1985
TAYLOR BOROUGH SITE

			Sample Identification Number						
			TB-TP 12D	TB-TP 18E	TB-TP 17C	TB-TP 17D	TB-TP 20	TB-TP 13E	TB-TP 19E
PP #	CAS #	Parameter	Traffic Report Number C9680	C9681	C9682	CA537	CA538	CA590	CA600
(38V)	100-41-4	ethylbenzene	42	--	--	--	--	--	--
(44V)	75-09-2	methylene chloride	140	160	110	66	180	140	120
(86V)	108-88-3	toluene	110	--	--	--	--	--	--
	108-10-1	4-methyl-2-pentanone	89	--	--	--	--	--	--
	1330-20-7	total xylene	480	--	--	--	--	--	--
(39B)	206-44-0	fluoranthene	--	--	--	--	--	14,000	--
(66B)	117-81-7	bis (2-ethylhexyl) phthalate	3,500	--	--	--	--	--	--
(72B)	56-55-3	benzo(a)anthracene	--	--	--	--	--	2,600	--
(73B)	50-32-8	benzo(a)pyrene	--	--	--	--	--	2,900	--
(74B)	205-99-2	benzo(b)fluoranthene	--	--	--	--	--	5,500*	--
(76B)	218-01-9	chrysene	--	--	--	--	--	5,400	--
(81B)	85-01-8	phenanthrene	--	--	--	--	--	6,000	--
(84B)	129-00-0	pyrene	--	--	--	--	--	2,000	--
(65A)	108-95-2	phenol	--	200	--	--	--	--	--
(91P)	57-74-9	chlorodane	--	--	--	--	40	--	--
(107P)	11097-69-1	PCB-1254	1,700	--	--	--	--	45	--

*Total of benzo(a) and benzo(k)fluoranthene

Results are given in µg/kg.
Complete analysis for HSL organics was performed; only those compounds detected are shown.
Dash indicates the parameter was not present above the detection limit.
The test pits presented here are located adjacent to Ponds 1 and 2.

5.8

Ground water samples were collected in August and October of 1984 and in April 1985. In August, 17 of 25 wells had enough water for adequate sample volumes. In October, only 12 had water while in April only 15 had a sufficient quantity of water to sample. Some wells have not produced any water since they were constructed. Two of these were installed up dip from the site in an attempt to delineate an upgradient and possible background flow. Thus, no background sample was collected.

None of the Primary Drinking Water Levels were exceeded for inorganics. The fact that iron and manganese exceeded Secondary Standards could be the result of the former mining operations. Organic contamination of the ground water was minimal in terms of (a) the number of wells affected; (b) the number of contaminants detected; and (c) their concentrations. Methylene chloride was detected at four locations while bis(2-ethylhexyl)phthalate was found at five locations with no apparent pattern. Monitoring well 3C, the most easterly and deepest well (191 feet), was the only well showing appreciable contamination in terms of the number of different organic contaminants detected (9 contaminants). Contaminants of concern in monitoring well 3C include 1,4-dichlorobenzene (29 ppb), 2,4-dinitrotoluene (10 ppb), and N-nitrosodi-n-propylamine (32 ppb). Both methylene chloride and bis(2-ethylhexyl)phthalate were absent from the ground water sample collected at this location. This well (3C) also did not produce enough sample volume during the second sampling series.

Organic chemical contamination of surface soil samples (composites of 0-2 feet soil/mine spoil cover) was minimal in terms of prevalence and concentration of organic compounds. High molecular weight organics (phthalates and/or polynuclear aromatic hydrocarbons) were detected in five surface soil samples. No particular pattern of contamination was obvious. The occurrence of these compounds in a region where anthracite coal was extensively mined and mine spoil was used as backfill for the landfill operations is not unexpected. These compounds also tend to bind tightly to the organic constituents in soils and are therefore relatively immobile.

The occurrence of inorganic (metals) chemicals in surface soils was widespread both in terms of prevalence and concentrations. A pattern of occurrence in the surface soils is apparent with lead and arsenic. Clusters of soil samples with elevated arsenic and lead levels were observed in the southwestern portion of Depression No. 2 and elevated lead levels were observed in Depression No. 3 (Table 2). Both of these areas were former surface drum storage areas.

Table 2

Sample Means *

(mg/kg)	Background	Depression 2	Depression 3
Arsenic	7.3	17.2	7.3
Lead	20.2	77.7	370.

* (Pg. 6-18 of Remedial Investigation)

Conclusions

° Severely fractured rock is present beneath the site. The rock formation has naturally-occuring fractures; however, as a result of the extensive underground coal mining (8 seams), the fracturing is more extensive than expected.

° Limited ground water flow enters the Diamond and Rock Coal strip mine pit that was used in the landfill operation.

° Ground water flow is controlled by fractures, joints, abandoned underground mine workings, and other mining related openings (for example, boreholes, shafts, strip pits).

° A continuous ground water level is not present across the site. Perched (localized pockets of water) water tables are present and have developed from the extensive rehandling of the soil materials and rock during the mining and landfill operations.

° Surface soils analysis indicated the presence of heavy metals in Depressions No. 2 and 3.

° Surface water analysis indicates the presence of limited volatile organics and pesticides. These contaminants are primarily in Pond No. 1.

° Sediment analysis indicated the presence of volatile organics and PCBs primarily in Pond No. 1.

° The area between Depressions No. 2 and 3 still has crushed drums and remnants that are on the surface and/or partially buried.

° Areas adjacent to Ponds Nos. 1 and 2 have drums protruding from the slopes.

Endangerment Assesment

The primary mechanisms for exposure to surface water and sediment-bound contaminants is by direct skin contact which may occur with occasional accidental contact with contaminants by site trespassers. Ingestion of contaminated surface water or sediments although unlikely is also a viable pathway. Toluene and carbon disulfide (detected in Pond No. 1) both have demonstrated mutagenic and reproductive effects in animal studies.

A discernable odor of volatile organic vapors persists within the boundaries and adjacent to former drum storage areas Nos. 1 and 2. These emmissions could constitute an inhalation threat to site trespassers.

Although the organic contaminants mentioned in the ground water have toxic biological health effects associated with them (suspected human and animal carcinogens with long term exposure), the risk of deleterious health effects to any individual in the vicinity of the site from consumption of the water is very minimal. Because of the general poor quality of the ground water in the Lackawanna Valley from acid mine drainage and hardness, which are distinct from any influence of the Taylor Borough site, ground water is not used for consumption in the area. Consequently, there is no known groundwater exposure pathway for the contaminants, nor are there likely to be any in the future. The most likely pathway of concern would be the discharge of the mine pool into the Lackawanna River which is located four miles downstream from the site.

The major contaminant pathway of concern with surface soil contaminants would be direct contact to site trespassers and wildlife. There was no indication of high arsenic and lead levels in ground water, surface waters, and sediments. This would suggest that there is no significant migration concern. Inhalation of dusts bearing lead at appreciable exposure levels also has a low probability of occurrence because of the high degree of vegetative cover on the site which tends to minimize dust generation.

Alternatives Evaluation

The major objectives for remedial action to be taken at the Taylor Borough site is to mitigate or eliminate environmental contamination through inhalation of organic vapors and direct contact with or ingestion of contaminated soils, sediments, and surface water. The decision whether remedial action is necessary for groundwater contamination (found in well 3C) will be deferred pending further investigation, in order to fully assess the nature of detected contamination.

It is important to note that any remedial alternative proposed onsite must consider the potential of subsidence. Mine subsidence, which resulted from the underground mining of numerous coal seams, is evidenced by documented gradual and catastrophic changes to surface topography and structural damage to buildings, roads, and utilities. A comprehensive study performed by H.R.B. Singer (1975) classified the site to be within a "precautionary area." This classification implies that future subsidence is probable if it has not yet progressed to completion. The report also predicted that subsidences in the vicinity of the site could vary from 1.3 to 16.3 feet from the pre-mining elevations.

In addition to mine subsidence, the site may incur other surface disturbance problems because of the settlement of the municipal refuse. Settlement will occur as a result of (1) physical changes to the fill caused by biological and chemical action; (2) water percolating through the wastes; and (3) the loading caused by the weight of subsequent layering of refuse or cover material. Although all of these factors are time-dependent and there is no information as to the amount of settlement and/or subsidence which has occurred, it is safe to assume that the site will settle if a site-specific remedial alternative requires additional fill material placement.

The NCP specifies that remedial alternatives should be classified either as source control (40 CFR 300.68(e)(2)) or offsite (management of migration) remedial actions (40 CFR 300.68(e)(3)). Source control remedial actions address situations in which hazardous substances remain at or near the areas in which they were originally located and are not adequately contained to prevent migration into the environment. Management of migration remedial actions address situations in which the hazardous substances have largely migrated from their original locations. Alternatives developed may fall solely in either classification or may involve a combination of source control and management of migration measures, as determined by the specific site problems addressed.

In an effort to determine remedial alternatives for the subject site, feasible technologies were identifed for consideration in each response action (source control and management of migration). Available technologies were then screened to eliminate all but the most definitive and implementable alternatives. This screening included: technical (site conditions or waste characteristics), environmental and public health, institutional, performance and cost criteria.

Certain response actions and technologies were not associated with any specific remedial obejctive or feasible technology for the site. These technologies and response actions and the rationale for not including them are listed on Table 3. Further detail of this initial screening is included in Section 2 of the Feasibility Study.

Those technologies that have passed the technology screening process were used to form remedial alternatives. Remedial alternatives were developed using best engineering judgement to select a technology or groups of technologies that best address the problems existing at the site to protect public health and the environment.

TABLE 3

Rationale for Eliminating
Various Technologies

Surface Water Controls	Rationale for Elimination
1. ditches grading dikes	- all, not directly associated with a response action
Leachate/Ground Water Controls	
1. Leachate Collection	- no visible leachate seeps
2. Containment Barriers	- limited lateral GW flow
3. Ground Water Pumping	- extensive fracturing of bedrock
4. Subsurface Collection Drains	- pumping of mine pool may increase subsidence
Direct Waste Treatment	
1. Gaseous Waste Treatment	- did not exceed background
2. Incineration of solids/liquids	- low organic content in soils, further disposal of inorganics required, low levels of organics in surface water, need auxiliary fuel
3. Biological Treatment Methods	- not useful for inorganic destruction in soils
4. Chemical Treatment Methods	- Technologies are waste specific-a soil/garbage matrix would be difficult to treat.

In order to study a range of responses, site remediation alternatives that fall into one of five different categories are developed. These categories are described below.

- No action: No-action alternatives could include monitoring activities.

- Alternatives that meet the CERCLA goals of preventing or minimizing present or future migration of hazardous substances and protecting human health and the environment, but which do not attain all of the applicable or relevant standards. (This category may include an alternative that closely approaches, but does not meet, the level of protection provided by the applicable or relevant standards.)

- Alternatives that meet CERCLA goals and attain all applicable or relevant Federal public health and environmental standards, guidance, and advisories.

- Alternatives that exceed all applicable or relevant Federal public health and environmental standards, guidance, and advisories.

- Alternatives specifying offsite storage, destruction, treatment, or secure disposal of hazardous substances at a facility approved under the Resource Conservation and Recovery Act (RCRA). Such a facility must also be in compliance with all other applicable Environmental Protection Agency (EPA) standards.

The evaluation criteria selected were: technical feasibility, public health, environment, institutional evaluation, and cost effectiveness. Particular emphasis was placed on:

- Technical Feasibility
- Performance
- Implementability
- Reliability

- Public Health Evaluation
  - Reduction of Health Impacts

- Environmental Evaluation
  - Reduction of environmental impacts
  - Protection of Natural Resources

- Institutional Evaluation
  - Legal requirements, institutional requirements
  - Community Impacts

- Cost Effectiveness
  - Capital Costs
  - Operation and Maintenance Costs
  - Present Worth Values
  - Sensitivity Analyses

Technologies remaining after the initial screening were combined in logical groups called components in order to fit into the five different categories mentioned above. These components were then combined to form various remedial alternatives. These associated alternatives are listed in Table 4 with associated costs.

Description of Remedial Alternatives

A. No Action Alternative

Alternative No. 1 - No Action with Monitoring

Under the no action alternative, additional remedial activities would not be performed. However, a long-term monitoring program would be established to provide information on contaminant concentrations remaining and extent of potential migration. The monitoring program would include ground water, surface water, sediment sampling, and respective analysis.

Ground water samples analyzed during the RI indicated that contamination was present in isolated wells at varying depths during one sampling series. Analytical results from the second sampling series did not detect the same contamination or sampling was not performed for specific wells because of a lack of sufficient water volume in the wells. Existing and two planned monitoring wells can be monitored to measure possible future migration of contaminants resulting from either the mining operation, landfill activities, or disposal of industrial wastes. Should significant increases in concentration, contaminants detected and/or number of wells indicating contamination occur, the site could be re-evaluated and remedial actions could be implemented if necessary.

Surface waters and sediments from Pond Nos. 1 and 2 were found to be contaminated and could pose a public health and environmental concern. Sampling and analysis at both locations would identify any change to the known contamination.

Due to seasonal variations sampling and analysis should be conducted on a quarterly basis for a period of 30 years. During this period, portions of the program can be revised and eliminated based on new data. It is recommended that ground water sampling not be eliminated.

TABLE 4

CAPITAL AND PRESENT WORTH COSTS
REMEDIAL ACTION ALTERNATIVES
TAYLOR BOROUGH SITE

	Remedial Action Alternative	Costs	
		Capital(1)	Present Worth
1.	No Action with Monitoring	$ 16,000	$1,402,000
*2.	Partially Remove Contaminated Materials, Dispose On Site, and Cover with a Soil Cap	1,418,000	3,341,000
3.	Same as No. 2 with Waste Stabilization prior to disposal.	1,681,000	3,604,000
4.	Same as No. 2, Except Completely Remove Contamianted Materials	1,480,000	3,403,000
5.	Same as No. 4, with Waste Stabilization prior to disposal	2,002,000	3,925,000
6.	Partially Remove Contaminated Materials Dispose On Site, and Cover with Clay Cap	1,835,000	3,758,000
7.	Same as No. 6, except Completely Remove Contaminated Materials	1,897,000	3,820,000
8.	Cover Individual Contaminated Areas with Clay Cap	2,343,000	6,051,000
9.	Completely Remove Contaminated Material and Dispose On Site in RCRA-Approved Landfill	12,185,000	14,296,000
10.	Drain and Treat Surface Waters, Backfill Depression, and Cover Entire Site with Clay Cap	47,029,000	48,594,000

TABLE 4
CAPITAL AND PRESENT WORTH COSTS
REMEDIAL ACTION ALTERNATIVES
TAYLOR BOROUGH SITE
PAGE TWO

Remedial Action Alternative	Costs	
	Capital(1)	Present Worth
11. Partially Remove Contaminated Materials and Dispose Offsite at RCRA-approved HWMF	5,612,000	6,998,000
12. Same as No. 8 except Completely Remove Contaminated Materials	9,793,000	11,179,000
13. Cover Area Bound by Drum Storage Areas 3 and 6, Inclusive and Drum Storage Area 4 with a Soil Cover	4,237,000	5,764,000

(1) Costs presented are rounded to nearest $1000 for comparison purposes. Detailed cost breakdown is presented in Appendix B of Feasibility Study.

* Alternatives 2 through 12 all include draining and treating collected waters from Ponds No. 1 and 2.

Site monitoring (described above), the remediation of Ponds 1 and 2 and adjacent former surface drum storage areas (which is described below) and removal of surface wastes (i.e., remnants and crushed drums) are three components that are common to most of the following alternatives unless specifically mentioned. Therefore, these components will not be described in detail with each alternative.

- COMMON TO ALL ALTERNATIVES -

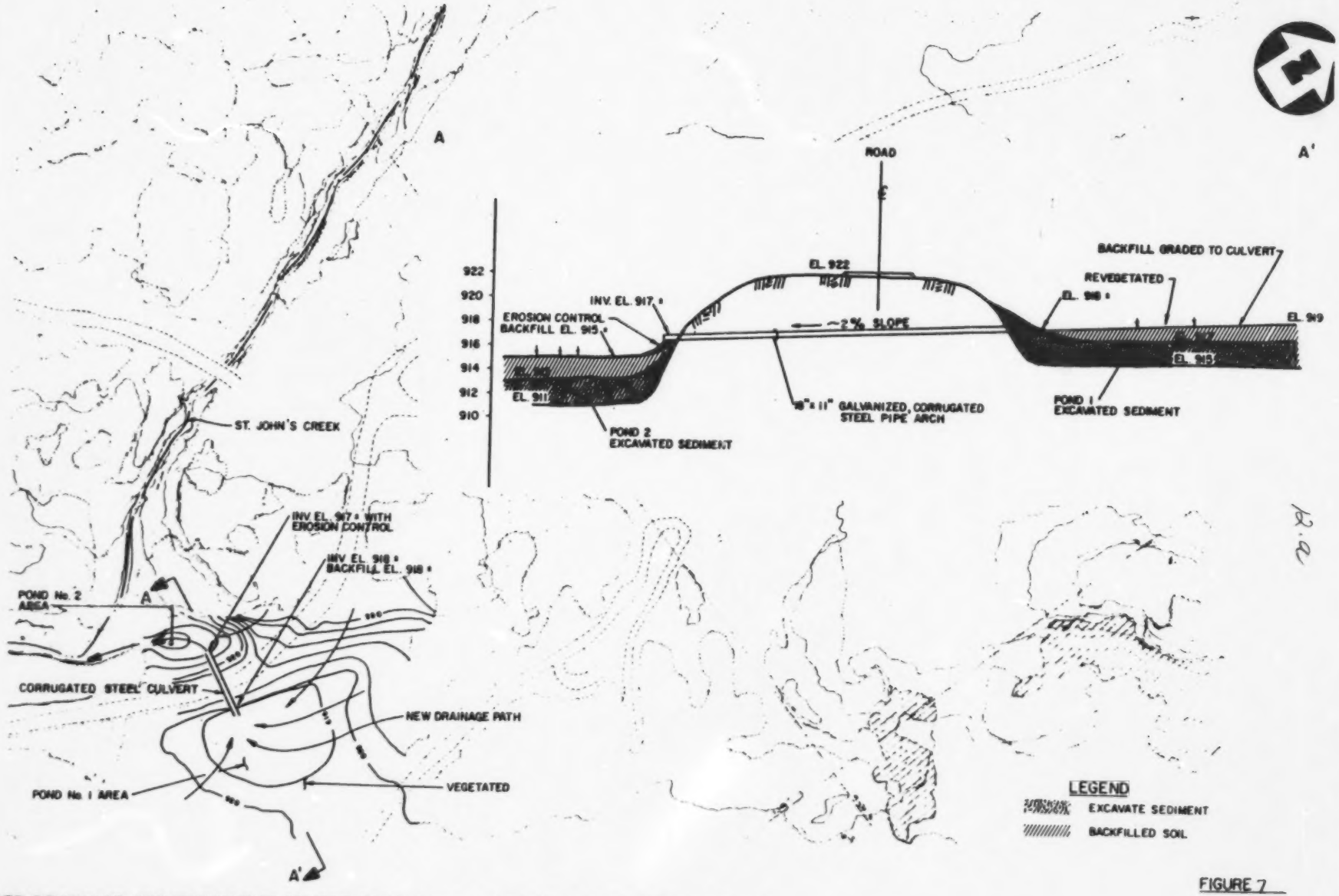
Drums Storage Areas 1 and 2, Including Ponds 1 and 2 (Figure 7)

Pond Nos. 1 and 2 are depressions or poorly drained areas that collect water and act as seasonal ponds with fluctuating water levels. Pond No. 2 was observed to dry up in the summer while Pond No. 1 varies from 1 to 3 feet of water, depending on the season. The estimated volume of water to be collected and eventually treated is approximately 191,200 gallons. The amount of water that needs to be treated can be reduced by minimizing surface water run-on and implementing this component of the remedial alternative during dry periods of the year. The water will either be pumped into an onsite activated carbon treatment system for subsequent discharge into St. John's Creek or into a 5,000-gallon tank truck using conventional pumps and transported to an offsite treatment facility. The use of a mobile treatment unit onsite would require approximately 10 days of treatment of 40 gpm. The offsite treatment would require approximately 39 truck trips to dispose of the contaminated water.

Once the ponds are drained, the sediments will be excavated to background levels from Pond Nos. 1 and 2 by conventional excavation practices (bulldozer and loader). The ponds receive runoff from a five acre vegetated/wooded area of the site. This results in low-sediment-bearing runoff. Therefore, sediments will be removed to an estimated depth of 2 feet, which totals about 1,100 cubic yards.

The materials (soils and wastes) in former Drum Storage Areas 1 and 2 would be excavated to background levels. The estimated areal and vertical extent of contamination was confirmed by test pits and soil sampling completed in March 1985. Quantity of materials to be excavated was estimated to a depth of approximately 8 feet within an approximate 0.3 acre area (about 13,500 square feet) which would result in 4,000 cubic yards of material.

Ultimate disposal of all excavated materials (sediments, soils and wastes) is described under each alternative. Following excavation of these areas and the ponds, the areas will be backfilled and regraded to promote proper surface runoff drainage. Depending on future use of the area or need for the access road that separates Pond Nos. 1 and 2, the area could be regraded with or without a culvert. In this alternative, a culvert is assumed to be installed and the access road reconstructed. This will prevent the future ponding of water in the area of Pond No. 1.



PROPOSED DRAINAGE AND GRADING PLAN FOR POND Nos. 1 AND 2 AND ADJACENT AREAS
TAYLOR BOROUGH SITE, TAYLOR BOROUGH, PA

FIGURE 7

100 0 100
SCALE IN FEET

Covering former drum storage areas Nos. 1 and 2 with soil was not evaluated since this remedy would not be an effective source control measure. Volatile organics in these areas would continue to emanate through a permeable cover. These compounds also exhibit high soil migration mobility indices (i.e. 4-methyl-2-pentanone and toluene are considered to be very mobile while methylene chloride is extremely mobile).

Capping these areas with clay was considered to be a reliable remedial technology since it would reduce the potential for air emmissions as well as infiltration of precipitation through contaminated materials. For the clay cap to be effective, its integrity must be maintained. Therefore, grouting of the mine voids beneath this area would be required to prevent subsidence. Compliance with RCRA closure and post closure regulations would also be required since above background levels of contamination would be left on site. Based on the higher cost of implementing this remedy and the fact that it does not substantially provide greater public health or environmental protection, this remedy was not considered for further detailed evaluation.

B. Alternatives that meet the objectives of CERCLA

Alternative No. 2 - Partially Remove Contaminated Materials, Dispose On-Site in Storage Area 6, and Cover with a Soil Cap

In addition to excavated materials from former Drum Storage areas 1 and 2 and sediments from Ponds 1 and 2, the surface soils in an area located southwest of former Drum Storage 6 will be excavated to a depth of 2 feet. These soils were found to have the highest levels (370 ppm ave.) of lead found during the RI surface soil sampling program. The excavation depth is associated to the depth of the landfill cover placed over the landfill wastes. Beneath this depth, landfill waste and/or a landfill/soil matrix exist. The estimated excavation volume is 8,900 cubic yards.

Vertical excavation of surface soils (landfill cover) down to the municipal waste interface may not constitute removal to background levels. Migration of hazardous waste into the garbage would require removal of the garbage. Should surface soil contamination due to unpermitted surface disposal (i.e. leaking drums) be similar to contamination commonly found in municipal waste, a distinct separation of RCRA Subtitle C (Hazardous) and Subtitle D (Municipal) waste would be difficult to ascertain.

All of the excavated materials, approximately 14,000 cubic yards total, would be disposed in former Drum Storage Area 6. Excavated areas and exposed garbage would be backfilled with local soils and mine spoil to provide a cover for revegetation and minimize adverse environmental concerns related to landfills.

A soil cap will be placed over the excavated material after it has been deposited into former Drum Storage Area 6. The cap will consist of a minimum of 24 inches of soil and/or mine spoil. Post closure maintenance of the soil cover will be required. The objective of this cap is to provide protection from direct contact exposure to the excavated material.

Alternative No. 3 - Partially Remove Contaminated Materials, Stabilize the Materials, Dispose Onsite in Storage Area 6, and Cover with a Soil Cap.

This alternative is similar to Alternative No. 2 with the addition of stabilizing the sediments and waste materials. A binding agent, such as cement, could be used to bind contaminated material in a stable, solid mass. Furthermore, the wastes are rendered virtually nonleachable. Based on the available site data, approximately one cubic yard of cement would be mixed with every 3 cubic yards of waste materials. This mixing could be accomplished by pre-manufactured soil blenders, farm discs, or earth moving equipment. For the partial removal alternative, the estimated volume of stabilized waste material to be disposed would be 22,400 cubic yards; an increase of approximately 5,600 cubic yards over non-stabilized partial removal. The combined mixture would then be disposed and soil capped in former Drum Area 6.

Alternative No. 4 - Completely Remove Contaminated Materials, Dispose Onsite in Storage Area 6, and Cover with a Soil Cap.

Complete removal includes all of the excavation described in Alternative No. 2 with the addition of approximately 2 feet of cover material being excavated from the former Drum Storage Areas 3 and 4, and the Removal Staging Area. These additional areas were included based on being former drum storage areas. Although surface soil sampling in these areas did not indicate significant levels of contamination which may have occurred from spillage of unpermitted disposal activity, analyses did indicate levels above background samples. The estimated volume of material to be excavated is about 2,600 and 1,850 cubic yards, respectively. The depth of excavation is again limited to the landfill cover above the municipal garbage (as described in Alt. 2). The total volume of material to be excavated for complete removal is estimated to be approximately 18,500 cubic yards. The additional excavated areas would also be backfilled so that exposed refuse would be covered with local soils or mine spoil to minimize adverse environmental concerns related to landfills and provide a cover for revegetation.

Alternative No. 5 - Completely Remove Contaminated Materials, Stabilize the Materials, Dispose Onsite in Storage Area 6, and Cover with a Soil Cap

This Alternative is similar to Alternative 3, with the additional areas described in Alternative 4. Based on this additional excavated material, the estimated volume of stabilized waste material to be disposed would be 40,000 cubic yards; an increase of approximately 10,000 cubic yards over the non-stabilized complete removal.

Alternative No. 6 - Partially Remove Contaminated Materials, Dispose Onsite in Storage Area 6 and Cover with a Clay Cap

This alternative is identical to Alternative No. 2 with the exception of placing a clay cap rather than a soil cover over disposed onsite materials. This cap would consist of a proposed minimum 2 feet of compacted clay material with a permeability of less than 1×10^{-7} cm/sec placed across the surface of the deposited waste. This clay material would have to be hauled in from offsite, since materials found onsite

are not sufficiently impermeable. A 12-inch-thick drainage layer would then be placed over the clay. This drainage layer would be composed of sand and/or pea gravel, and have a minimum permeability of 10^{-3} cm/sec. The drainage layer would be covered with a geotextile material acting as a filter to minimize fine soil materials from clogging the drainage layer. A minimum of 24 inches of soil would then be placed over the clay to protect the clay and to provide a root-growth zone.

Alternative No. 7 - Completely Remove Contaminated Materials, Dispose Onsite in Storage Area 6, and Cover with a Clay Cap

This Alternative is identical to Alternative 4 with the difference of placing a Clay Cap over disposed onsite materials instead of a soil cover.

Alternative No. 11 - Partially Remove Contaminated Materials and Dispose Offsite at RCRA-approved HWMF

This alternative is similar to Alternative No. 2 with the exception that contaminated sediments, soils, and crushed drums would be loaded into 20 cubic yard trucks, and hauled to an offsite RCRA-approved Hazardous Waste Management Facility (HWMF) for disposal. The estimated volume of material to be disposed is approximately 16,800 cubic yards.

C. Alternatives that Attain All Applicable Standards

Alternative No. 8 - Cover Individual Contaminated Areas with a Clay Cap

This alternative entails draining and treating Ponds 1 and 2 which is common to other althernatives but not excavating contaminated soils and sediments in former drum storage areas 1 and 2, and within the ponds. The strategy is to treat all of the former drum storage areas as individual waste management areas. These would be covered with a clay cap and monitoring wells would be placed outside but adjacent to each individual area in an effort to monitor for post-closure migration.

Alternative No. 9 - Completely Remove Contaminated Materials, Dispose Onsite in a RCRA-Approved Landfill

A RCRA designed onsite landfill would be located on natural soils at the south end of the site. Contaminated soils and materials from the former drum storage areas (as described in Alt. No. 4) as well as sediments from Ponds 1 and 2 would be excavated and disposed in this landfill.

The landfill cap is the same as described under Alternative 6 with the addition of a 30 mil synthetic liner between the clay and the drainage layer. The bottom double liner is a combination clay and synthetic membrane liner. A leachate collection and removal system will collect leachate generated during and after construction and store it in a 5000-

gallon underground storage tank. Geotextile filter fabric would be placed between the waste and the leachate collection zone to prevent clogging of the collection zone by soil fines migrating with the leachate from the waste. The primary liner is a minimum 30 mil synthetic membrane. The leak detection zone is directly beneath the primary liner and monitors the integrity of that liner. Both the leachate collection and the leak detection zones will have a permeability $\geq 10^{-4}$ cm/sec. The leak detection zone will drain to the same 5000-gallon underground storage tank as the leachate collection zone.

The secondary liner is a composite liner of synthetic membrane and clay. The synthetic membrane will also be a minimum thickness of 30 mil and be placed over a 2 foot clay barrier.

Prior to construction of the landfill, all mine voids below the landfill must be grouted closed to alleviate the potential for mine subsidence. An eight foot base of clean fill would also be placed where the onsite disposal facility is proposed to provide a barrier between the landfill and the seasonal high water table. Associated with this alternative is post closure ground water monitoring.

Alternative No. 10 - Drain and Treat Surface Waters, Backfill Depressions, and Cover Entire Site with a Clay Cap

The surface waters from the site will be drained and treated depressions backfilled with local soil, and the site covered with a clay cap. With the exception of the depressions, the cap will basically follow the current slope of the site. St. John's Creek will be channeled through a 72-inch corrugated metal pipe culvert.

Because of the presence of garbage onsite, gas vents would be required to dissipate the methane gases formed from anaerobic decomposition of biodegradable organics. Two rows of gas vents will be required, one row in each strip pit. They will be spaced on 100-foot centers and be constructed of 6-inch, perforated PVC pipe and gravel. To prevent gases from escaping at the edge of the strip pit, a 4-inch-diameter perforated PVC pipe will be installed in a gravel trench. Four-inch PVC risers installed on 200-foot centers will vent gases from the trench to the atmosphere.

Alternative No. 12 - Completely Remove Contaminated Materials and Dispose Offsite at a RCRA-approved HWMF

This alternative is similar to Alternative No. 4 with the exception that contaminated sediments, soils, and crushed drums would be loaded into 20-cubic yard trucks and hauled to an offsite RCRA approved Hazardous Waste Management Facility. The estimated volume of material to be disposed is approximately 30,000 cubic yards.

Alternative No. 13 - Cover Area Bounded by former Drum Storage Areas 3 and 6 Inclusive, and Drum Storage Area 4 with a Soil Cover

A soil cover will be placed over former Drum Storage Areas 3 and 6 and the entire area between the two. Initially, however, the depressions will be filled in with local backfill or spoil. When needed, extra backfill will be brought in to provide for proper drainage. The existing grade will be used where possible. The soil cover will consist of a minimum of 1.5 feet of material with a with a final 6 inch layer of topsoil. The cover would then be vegetated to prevent potential erosion and sedimentation. A grasslined diversion ditch will be constructed around the entire covered area to convey runoff and run-on away from the area.

A methane gas generation survey will be performed during preliminary design to evaluate the need for a gas venting system. If the rate of gas generation is low, it would be less hazardous to allow the gas to permeate through the soil cover versus a central collection and venting system. A build up in concentration and pressure could result in an explosion or fire. For costing purposes, a passive gas venting system has been incorporated into this alternative. Gas vents could be installed on 100-feet centers to vent methane gas that is generated from the anaerobic degradation of solid waste (figure 8). Since this area will be final-graded to a relatively flat condition, a chain link fence will be installed around the perimeter to protect the soil cover from site trespassers. The access road will also be relocated at the southern tip of the covered area.

Former Drum Storage Area 4 will be backfilled with local fill or spoil to a slope of 3:1 (horizontal:vertical) to provide for run-off. The area will then be covered with a minimum of 1.5 feet of covered material, 6 inches of topsoil, and vegetated. This cover will overlap the top edge of the highwall by about 20 feet. The existing access road will be relocated around the area at the bottom of the slope. Figures 9 and 10 show a plan view and a cross-section, respectively, of this area. A chain link fence will also be installed surrounding this soil cover.

Common to most of the other alternatives, Remedial Action Alternative No. 13 also includes site monitoring and remediation of former Drum Storage Areas 1 and 2, including Ponds 1 and 2.

D. Alternatives that Exceed All Applicable Standards

The complete removal of the entire landfill site (125 acres) was screened out because there is no evidence that the entire landfill was used for unpermitted hazardous waste disposal. The costs to excavate 6,100,000 cubic yards of predominantly municipal wastes and mine spoil, dispose offsite in a permitted Hazardous Waste Management Facility (HWMF), and then backfill the area would be in excess of 1.2 billion dollars. Furthermore, based on known data, the result would provide no greater benefit than excavating and/or covering the former drum storage areas and sediments in Ponds 1 and 2.

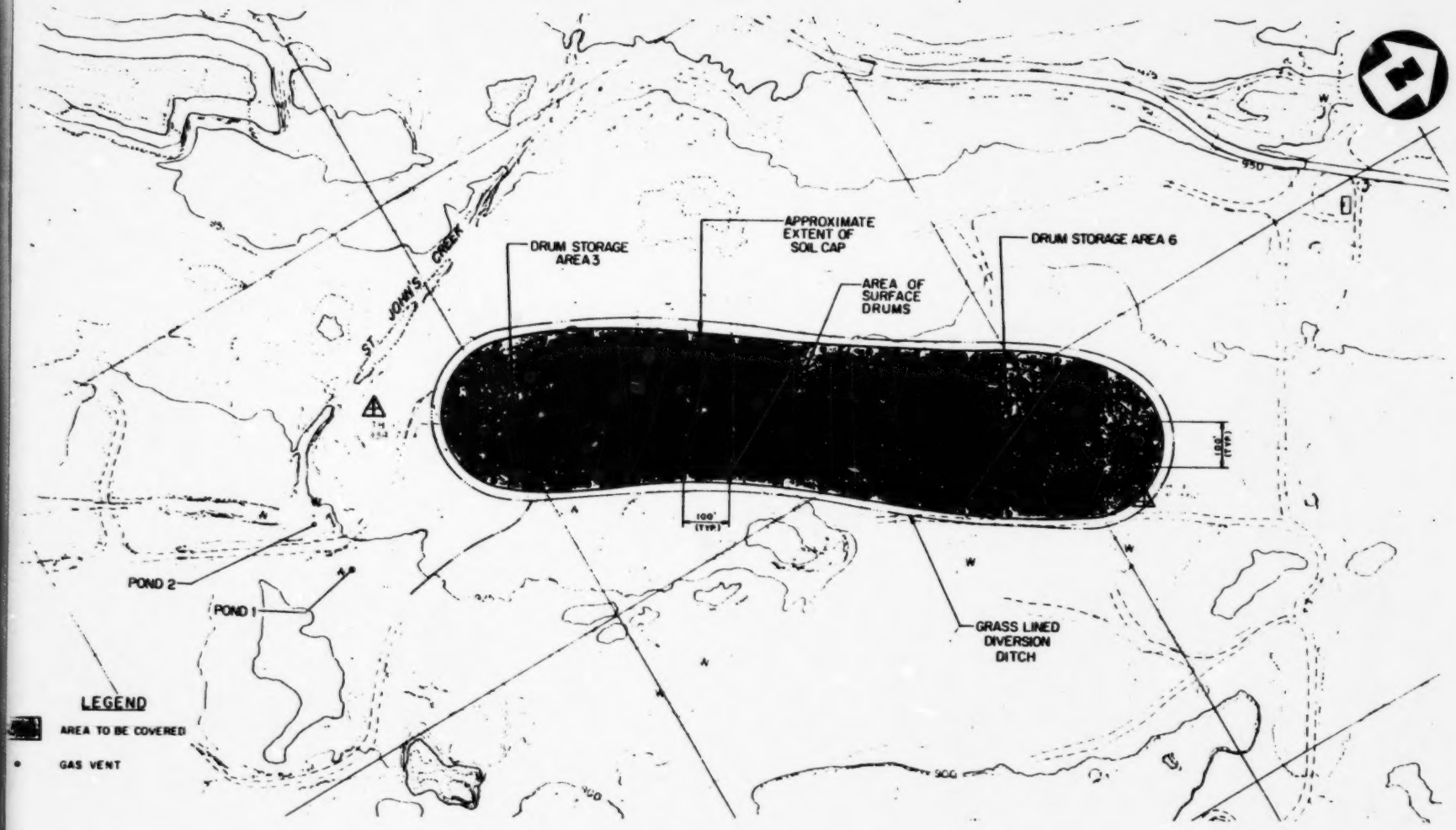


FIGURE 8

APPROXIMATE LIMITS OF SOIL COVER
TAYLOR BOROUGH SITE, TAYLOR BOROUGH, PA
SCALE: 1"=200'

200 0 200
SCALE IN FEET

17a

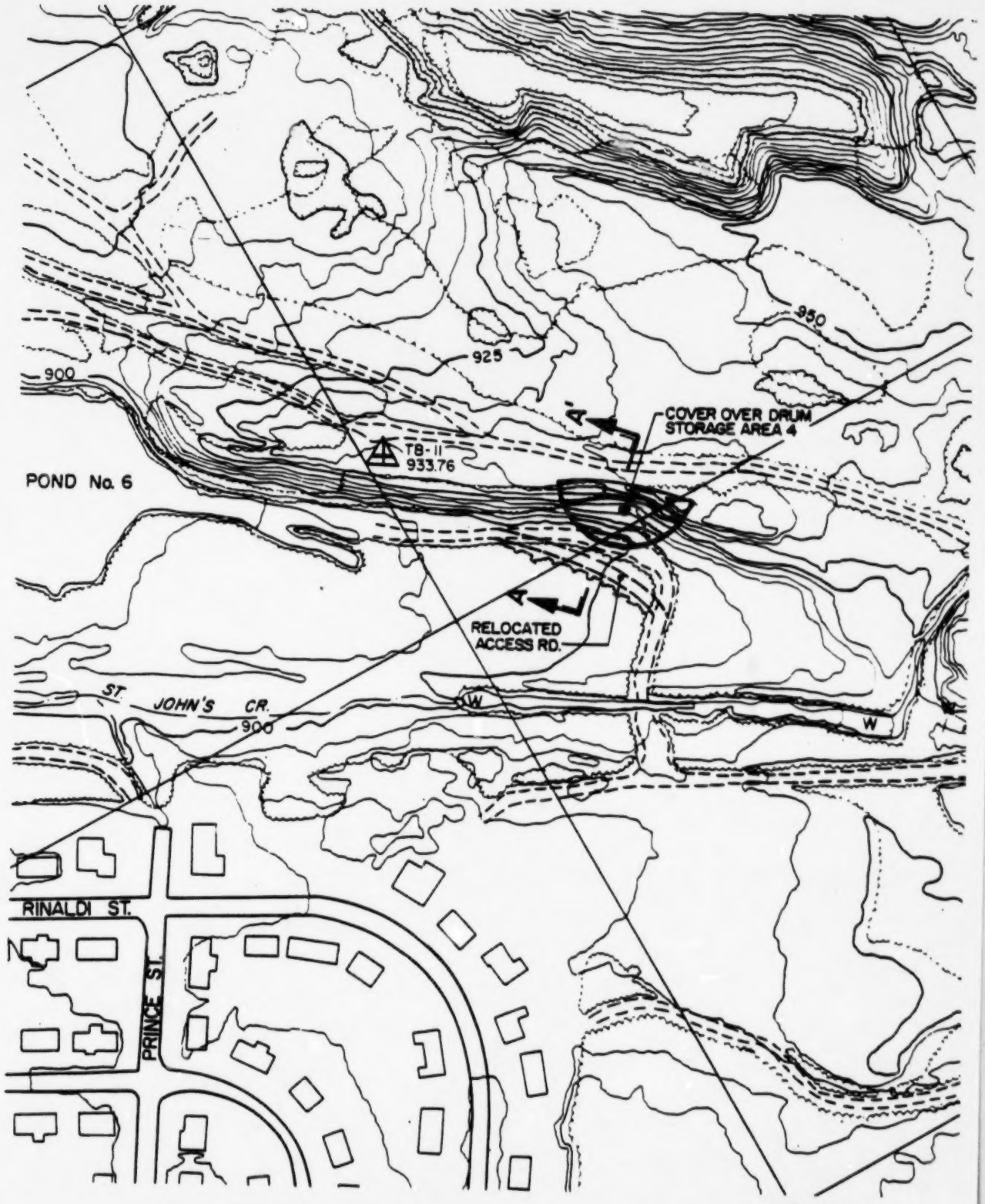
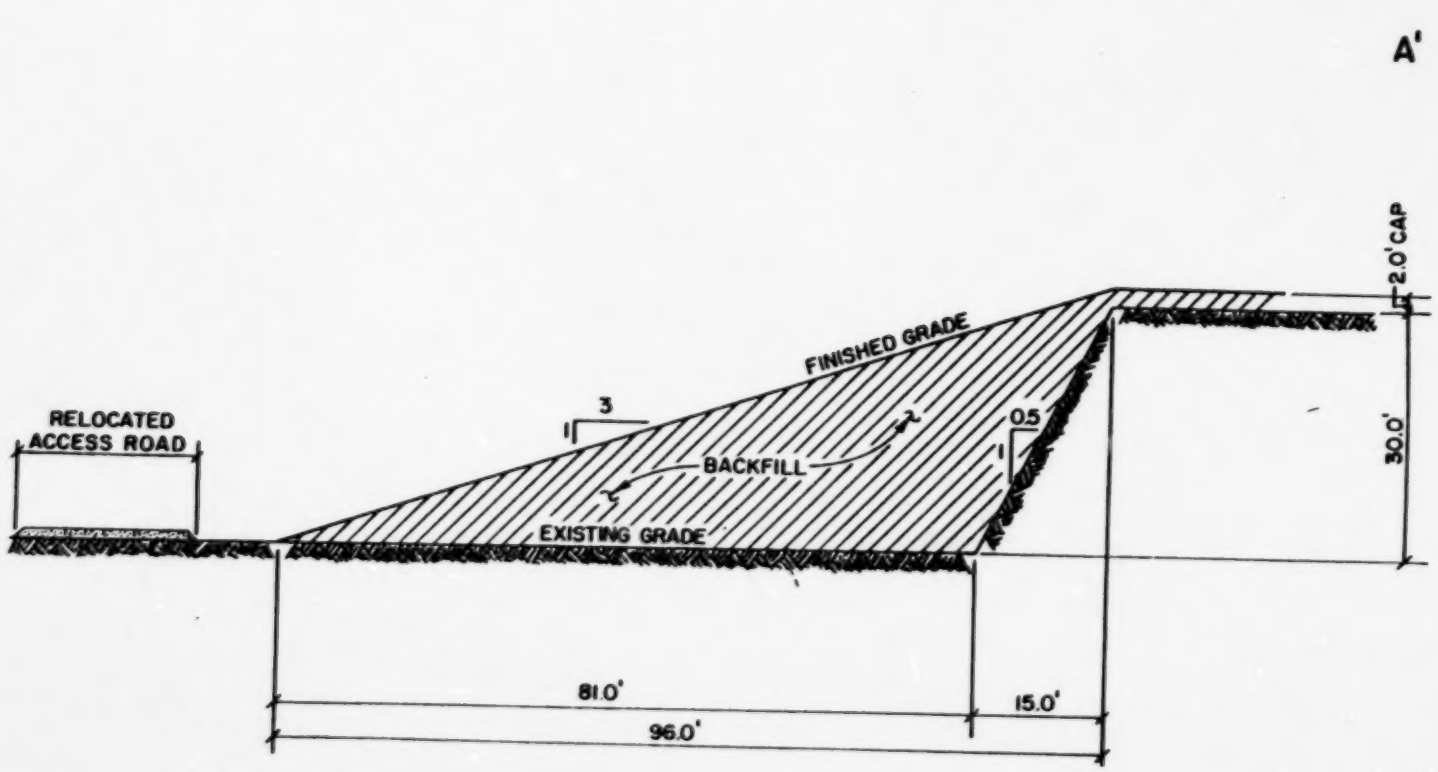


FIGURE 9

SOIL COVER OVER AREA 4
TAYLOR BOROUGH SITE, TAYLOR BOROUGH, PA
SCALE: 1"=200'



17.C

FIGURE 10

GENERALIZED CROSS SECTION A-A'
TAYLOR BOROUGH SITE, TAYLOR BOROUGH, PA
NOT TO SCALE

Alternative/Components	Costs (x1000) Cap.	Present	Public Health Considerations	Environmental Considerations	Technical Considerations	Other
. No Action with Monitoring	16	1,400	Continued direct contact exposure and inhalation to site trespassers of contaminents in Ponds 1 and 2, sediments, and surface soils.	Low migration potential of existing contamination but direct contact and inhalation from Pond 1 and 2 still remain.	Two new wells needed to supplement existing wells. Source of ground water contamination will need to be identified (mine spoil/municipal waste/industrial disposal).	Not acceptable to public
. Partial Removal, Dispose Onsite and Cover with a Soil Cap	1,418	3,341	Will prevent direct contact with highly contaminated material.	Does not totally remove source of site contaminants.	Depth of excavation is limited to municipal garbage buried beneath existing soil/spoil cover. Depressions will require extensive quantity of backfill material.	Does not comply with RCRA regulations - material not disposed in a double lined facility.
. Same as Alt. 2 with Stabilization of Materials prior to Onsite Disposal	1,681	3,604	Same as 2	Leaching of contaminated materials will be greatly reduced.	Performance of binding agent is dependent on percentage and type of soil being mixed.	Sames as 2
. Complete Removal, Disposal Onsite and Cover with a Soil Cap	1,408	3,403	Same as 2. Addresses all contaminated areas found above background.	Totally removes source of site contaminants.	Same as 2	Same as 2 Addresses areas where concentrated disposal of surface drums had occurred.

P'41

Alternative/Components	Costs (x1000) Cap.	Present	Public Health Considerations	Environmental Considerations	Technical Considerations	Other
5. Same as Alt. 4 with Stabilization of Materials prior to Onsite Disposal	2,002	3,925	Same as 2.	Same as 3.	Same as 3.	Same as 2.
6. Same as Alt. 2 but Cover with a Clay Cap.	1,835	3,758	Same as 2.	Clay Cap would reduce infiltration through contaminated materials.	Due to settlement/ subsidence potential maintenance of clay cap would be more difficult than a soil cover.	Same as 2.
7. Same as Alt. 4 but cover with a Clay Cap	1,897	3,820	Same as 4.	Same as 4 & 6.	Same as 6.	Same as 2.
8. Cover Individual contaminated Areas with a Clay Cap	2,343	6,051	Same as 4. Minimizes worker exposure to contaminated ares.	Same as 6.	Subsidence potential would require grouting of mine voids - Higher cost.	Would meet intent of RCRA
9. Complete Removal and Dispose Onsite in a RCRA Approved Landfill.	12,185	14,296	Same as 4.	Provides greatest onsite protection against contaminated materials	Grouting of mine seams may be difficult. Eight foot base of clean fill needed to avoid seasonal high water table.	Will comply with RCRA if successfully constructed
10. Drain and Treat Surface Waters, Backfills Depressions, Cover Entire Site with a Clay Cap	47,029	48,594	Sames as 4.	Same as 6. No additional benefit would be realized.	Without grouting mine voids and preventing settlement of garbage integrity of cap is questionable and will require maintenance. Methane Gas vents	Would meet intent of RCRA

17.e

Alternative/Components	Costs (x1000) Cap.	Present	Public Health Considerations	Environmental Considerations	Technical Considerations	Other
11. Partial Removal, Dispose Offsite at RCRA approved HWMF.	5,612	6,998	Will eliminate direct contact with highly contaminated materials. Potential for accidental spill in transit.	Only risk would be low but finite probability of exposure in transit due to accident spill.	Depth of excavation will be limited to municipal garbage buried beneath existing soil/spoil cover.	Does not comply with RCRA since all above background surface soils are not addressed.
12. Complete Removal, Dispose Offsite at RCRA approved HWMF.	9,793	11,179	Will eliminate direct contact with all areas found with contamination above background.	Same as 11.	Same as 11.	Complies with RCRA.
13. Cover area Bounded by Former Drum Areas 3 and 6, inclusive, and former Drum Storage Area 4.	4,237	5,764	Same as 2 & 4.	Proper grading and cover should reduce infiltration through contaminated materials.	Same as 10 but rehabilitation of soil cover will be easier than repairing clay/synthetic cap.	Complies with RCRA. Acceptable to public.

17-F

E. Alternatives that Specify Offsite Disposal

Alternatives 11, 12, and 13 would comprise alternatives which fit into this category.

Recommended Alternative

Section 300.68(j) of the National Contingency Plan (NCP) [47 FR 31180; July 16, 1982] states that the appropriate extent of remedy shall be determined by the lead agency's selection of the remedial alternative which the agency determines is cost-effective (i.e., the lowest cost alternative that is technically feasible and reliable) and which effectively mitigates and minimizes damage to and provides adequate protection of public health, welfare, and the environment. In selecting a remedial alternative EPA considers all environmental laws that are applicable and relevant. Based on the evaluation of the cost-effectiveness of each of the proposed alternatives, the comments received from the public, information from the Feasibility Study and information from the Pennsylvania Department of Environmental Resources, we recommend Alternative No. 13 be implemented at the Taylor Borough Site. This selected remedy will satisfy all of the site surface contamination objectives identified in the Remedial Investigation.

Specifically, draining and treating contaminated surface water in Ponds 1 and 2 will eliminate the direct contact and ingestion pathways. Removal of contaminated sediments would also eliminate the threat of direct contact exposure.

Excavation and offsite disposal of contaminated soils and waste materials in former Drum Storage areas 1 and 2 will eliminate further contamination of Ponds 1 and 2. Capping this area was determined to be less cost effective.

The results of the surface soil investigation of former drum storage areas did not find concentrated levels of contamination which would indicate that severe drum spillage or bulk disposal of industrial wastes had occurred, but did indicate above background levels. In order to prevent direct contact with these areas and to minimize the translocation of low level contaminated surface soils where sample results indicate higher than background levels, a soil cover will be installed. The soil cover will provide an effective barrier for direct contact and with proper grading will reduce the amount of infiltration caused by precipitation. The final cover must have a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present. Based on: (1) the low levels of contamination (both inorganic and organic) found in the surface soils; (2) groundwater samples taken from the Rock Coal Seam which did not exceed primary inorganic maximum contaminant levels; and (3) organic compound mobility indices, it is not felt that surface soil contamination will have an adverse impact on the mine pool.

Upon completion of the recommended remedial actions, future land use activities should be restricted so as not to result in damage to or removal of the soil cover, gas vents (if installed), and other structures necessary to ensure long-term integrity and effectiveness of the remedial response.

It is further recommended that a selection of remedial response measures, if any, for contaminated groundwater be deferred. Additional studies will be conducted to determine if remedial action is required.

Operation and Maintenance

Monitoring and Post-Closure Maintenance activities are required to verify the site cleanup, effectively maintain permanent onsite actions, and monitor potential contaminant migration. Sampling of surface water and sediments in St. Johns Creek and Ponds 1 and 2 should be performed for at least five years on an annual basis to verify respectively that contaminants either are not migrating or have been removed. These samples will be analyzed for Hazardous Substance List (HSL) parameters. Should Ponds 1 and 2 be eliminated by not restoring the access road, surface water sampling would only be required for St. John's Creek.

Closure and Post Closure care will comply with RCRA Subpart G (which includes the closure performance standard) and also section 264.310. A groundwater monitoring program will be developed during design only for the soil covered waste management areas.

The soil cover will be effective as long as it is not disturbed. Post-closure inspection and maintenance is required to restore and rehabilitate the soil cover should subsidence or differential settlement occur. Routine vegetative cover regrading and reseeding would also be required to ensure the integrity of the cover.

All operation and maintenance requirements will be the responsibility of the State of Pennsylvania one year subsequent to completion of construction.

The long-term groundwater monitoring segment for the entire site (as described under the "No Action-with Monitoring" alternative) will not be implemented at this time. Specific groundwater monitoring requirements will be proposed upon completion of additional study.

Evaluation of Alternatives Not Selected

The No-Action with Monitoring alternative was not selected since residual surface soil, sediment, and surface water contamination will continue to pose a direct contact threat to human health and the environment. The odors emanating from Ponds 1 and 2 also would persist, causing a localized inhalation concern to site trespassers.

Alternatives 2, 4, 6, and 7 all have a common implementation problem. Once contaminated materials are excavated, these materials, in order to comply with RCRA, must be deposited in a secure, "double lined" land disposal facility. Disposal of contaminated materials under these alternatives is accomplished by simply placing the contaminated materials in an onsite depression without any bottom liner(s).

Alternatives 3 and 5, which propose stabilization of contaminated materials, were not selected since this treatment method would require that testing procedures, treatment methodologies, and final properties of the ultimate material be proven reliable and effective. Waste characterization, compatability with other waste materials, physical properties, and leachability of the stabilized wastes would require detailed treatability study and lengthy testing in order to demonstrate whether this alternative could be acceptably implemented.

Alternative 8 was not selected since it does not effectively remediate former drum storage Areas 1 and 2. Covering these two areas with a clay cap will require grouting of mine voids to ensure cracking due to potential subsidence. Grading and backfilling would be required to divert site runoff from coming in contact and ponding against the cap. These added costs would make this alternative less cost effective than the selected alternative.

Alternative 10 was not chosen since it was not established that the entire 125 acre site warranted remedial action. Surface sampling and subsurface investigations did not indicate remedial action was needed for the majority of the site. This alternative was less cost effective by an order of magnitude than the selected alternative.

Alternative 11 was not selected based on not addressing above background levels of inorganics in the surface soils. These areas were not proposed to be covered or excavated.

Alternatives 9 and 12 both would achieve the same level of cleanup as the recommended alternative but were more expensive to construct and implement. Thus, these two alternatives are less cost effective.

Consistency with Other Environmental Laws

EPA is currently proposing regulation requiring the agency to select a remedial Superfund remedy which "... attains or exceeds applicable or relevant Federal public health or environmental standards." See proposed 40 C.F.R. §300.68(f).

Environmental laws which may be applicable or relevant to remedial activity are:

- National Environmental Policy Act (NEPA)
- Clean Air Act (CAA)
- Clean Water Act (CWA)
- Safe Drinking Water Act (SDWA)
- Resource Conservation and Recovery Act (RCRA)
- Pennsylvania Clean Streams Act
- Toxic Substances Control Act (TSCA)

This alternative meets NEPA functional equivalency exception because the necessary and appropriate investigation and analysis of environmental factors as they specifically relate to the Taylor Borough Site and the recommended alternative were considered and evaluated in the Remedial Investigation and Feasibility Study. In addition, a meaningful opportunity for public comment on environmental issues was provided before the final selection of the remedial alternative was made.

Compliance with all applicable substantive requirements of the CWA and CAA as well as the Pennsylvania Clean Streams Act will be incorporated into the design of the remedial alternatives. Any discharge into the atmosphere of gas from the excavation of former drums storage areas 1 and 2 will be monitored and treated as necessary. All state permits for discharge of treated surface water will be acquired and complied with as necessary.

The soil cover placed over former drum storage areas 3, 4, and 6 and the area between 3 and 6 shall be designed to meet EPA's engineering specifications for constructing the RCRA cover required by 40 C.F.R. §264.310. Ground water monitoring shall be developed during design to satisfy the requirements §264 Subpart F.

Excavation of contaminated materials and sediments in former drum storage areas 1 and 2 will be removed to background levels which will eliminate the need for a RCRA cover and post closure requirements for land disposal at these locations and also comply with TSCA.

Further investigations of ground water was elected to satisfy the requirements of RCRA Part 264 Subpart F. Organic contamination was detected in monitoring well 3C. RCRA Part 264 Subpart F would require further investigation as to the nature, source, and extent of this contamination. Additional study work will determine the need as to whether Subpart F will be implemented.

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
841 Chestnut Building
Philadelphia, Pennsylvania 19107

SUBJECT: Possible Public Health Hazards at the Taylor Borough Site

DATE: JUN 28 1985

FROM: Dick Brunker, Toxicologist
Site Investigation and Support (3HW23) DB

TO: Joe Dugandzic, Environmental Engineer
Site Response Section (3HW21)

Levels of soil contaminants reported at this site are, in general, typical of those found at municipal landfills. There are no data citations that indicate the presence of substances that are particularly outstanding or alarming nor is there any reasonable scenario that could establish a linkage to human or ecological receptors that would justify any remedial measures that should extend beyond those designed to minimize the translocation of contaminated soils. Such measures should be limited to those that would stabilize this site and should include the elimination of occasional ponds and the integration of the drainage patterns of the site into the watershed in a manner that would minimize or eliminate the movement and impact of surfical sediments on the local ecology.

The area that emanates the odor of volatile organic compounds or similar odors is the cause of some concern. Although the precise chemical nature of these odors is not known, past reports of detectable levels of airborn carcinogens such as tetrachloroethylene and methylene chloride as well as other volatile organic compounds could indicate the presence of a conceivable hazard to individuals who trespass into the area. It is recommended that measures be taken to remediate the emanation of these vapors from this area. The protection of workers concerned with this remediation is also recommended.

23

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
841 Chestnut Building
Philadelphia, Pennsylvania 19107

SUBJECT: RCRA Review of Taylor Borough
Draft Feasibility Study

DATE: JUN 19 1985

FROM: Gary Molchan, Environmental Engineer
MD/DE/DC Section (3HW32)

TO: Thomas Voltaggio, Chief
Superfund Branch (3HW20)

THRU: Patrick R. Anderson, Acting Chief
Waste Management Branch (3HW30)

Attached you will find the RCRA review of the alternatives proposed by NUS for the Taylor Borough Superfund Site. This report was developed to determine if outlined Remedial Alternatives (RA) meet the provisions of the RCRA regulations. The site's geologic and hydrologic conditions severly limit the alternatives available. This is evidenced by the information contained in Sections 2, 4, and 5 of the RI.

The attached table compares Superfund alternatives to proposed Remedial Actions. Each of these alternatives lacks the sufficient background information necessary to make a determination regarding the ability of the alternatives to meet the provisions of RCRA. Development of a dynamic ground water monitoring program that will identify the release of hazardous constituents into the ground water must be undertaken in order to comply with the provisions of RCRA in the event that CERCLA chooses to allow hazardous constituents to remain on site. Determination of the degree of contamination that exists in the soils should accompany any action prior to development of a dynamic ground water monitoring program. This may be accomplished by evaluating remaining soil samples for hazardous constituents at the base of the units after the contaminated soil has been removed to determine the depth and lateral migration of contamination. Proper RCRA closure of the facility must also include a cover with a permeability less than or equal to the permeability of the natural subsoil present with assurances for long term stability.

Table 1

CERCLA ALTERNATIVES

Remedial Actions	1	2	3	4	5	6	7	8	9	10	11	12	13
No Removal of Soil*	x							x		x			x
Partial Removal*		x	x		x	x					x		
Complete Removal**				x			x		x			x	
Dispose On-site													
Soil Cover		x	x	x	x								x
RCRA Cover						x	x	x		x			
Stabilize			x		x								
RCRA Landfill									x				
Dispose Off-site													
RCRA Landfill											x	x	

*A dynamic ground water monitoring program must be developed in order to implement these alternatives.

**A scientific determination of the excavation limits due to background must be identified in order to implement these alternatives.

RCRA Review of the Feasibility Study of Alternatives for the Taylor Borough Site, Lackawanna County, Pennsylvania

Ground Water Monitoring

These alternatives propose a long-term monitoring program to provide information on the migration of contaminants. Figure 2-2 of the FS identifies approximate limits of complete removal of soil and drums from the site. These areas, eight (8) in total, could each be considered a waste management unit subject to the monitoring requirements of RCRA in the event that clean closure is not possible. Hypothetically, the eight units identified could be consolidated into 1 waste management area; the area must however be monitored according to its final disposition. Complete removal requires testing of the soil to certify that background has been achieved. This would eliminate the monitoring requirement and allow clean closure.

The complex natural geology, strip mine activities, deep mine activities, landfill area, and subsequent development along the perimeter make the conditions for monitoring and identifying hazardous constituents and their projected locations of origin very difficult. Development of a monitoring program may be undertaken to identify the hazardous constituents that exist in the vadose zone, saturated zone, deep rock formations, and mine pool. All of these monitoring alternatives must incorporate a dynamic philosophy as the RCRA ground water monitoring regulations do not ideally fit the conditions of this site. Further, in the event that a dynamic ground water monitoring program is developed that satisfies the RCRA requirements, serious consideration should be given to the validity of the data that will be provided in determining the origin of the pollutants and their rate and extent of migration in the unconsolidated soil and ultimately their potential disposition in the mine pool.

Therefore, in order to clearly meet the ground water protection standard of §264.92, a strategy must be developed to clearly delineate the hazardous constituents previously identified in Section 3 of the FS in lieu of Appendix VIII as identified in §264.93, the concentration limits of §264.94, and the point of compliance in §264.95. Only then can a corrective action program be developed according to §264.100 incorporating the ground water monitoring requirements of §264.97 that will monitor the constituents that exceed the respective concentration limits, the rate and extent of the migration and the ground water flow rate and direction.

Closure

The closure options available at the waste management units are identified in §264.178, §264.228 and §264.258. In the event that after removing all residues and making all reasonable efforts to effect removal of contaminated subsoils, one finds that not all contaminated subsoils can be removed practically, the units must be closed as a landfill under §264.310. In this event, ground water monitoring would be required and a program to identify contaminant levels prior to a corrective action plan being implemented should be developed.

Also Section 4, pages 4-5 through 4-8, of the RI clearly identifies areas of high magnetic intensity creating anomalies 5% above background base levels of 56,000 gammas. None of the test pits were in these areas of higher magnetic intensity; they are on the perimeter. Therefore, the potential of additional buried drums is a problem that should be addressed. Additional studies should be completed before the alternatives proposed can be determined technically sound.

Identification of background constitutents is necessary prior to taking any action at the site in order to identify the increasing levels or decreasing levels of pollution and the resulting effects due to releases of waste constituents presently traveling toward the point of compliance.

Remaining containers, liquids, liners, bases and soil containing or contaminated with hazardous waste or hazardous waste residuals must identify a testing procedure and protocol to identify the hazardous constituents in the soil, removal standards to attain the closure performance standard in §264.111 and identification of background limits. The separation between hazardous waste and municipal waste is difficult to ascertain; however, this separation must be clear and consistent in this and all future applications of hazardous and non-hazardous waste coexisting in waste management units for which Feasibility Studies are completed.

In the Feasibility Study Report Section 3.3.2, excavation in drum storage areas 1, 2 and 6 including ponds 1 and 2, must identify a testing procedure whereby excavation and removal will cease. Identification of a depth of approximately 8' is inappropriate.

Composite samples of the soil and testing of these samples to determine the toxicity thru extraction (EP toxicity) will clarify the question that has arisen regarding the mobility of the inorganic and organic hazardous constituents in the soil and solid waste. Due to the lack of this information, the proposed alternatives are presently not complying with the closure requirements of §264.178, §264.228, and §264.258.

In 3.3.4, the alternative of excavating contaminated soil and depositing this soil on-site in an unlined land disposal unit is unacceptable. Once excavated, the contaminated soils, sediments, and wastes must be deposited off-site in a RCRA approved landfill.

Stabilitzation thru excavation and treatment (use of a bonding agent) or in-situ treatment is an alternative that requires approval of the testing procedures, treatment methodology and final properties of the ultimate material. The characterization, compatibility, physical properties and leachability of the stabilized wastes are not provided. In the event that this alternative is pursued, procedures and information necessary to comply with RCRA are outlined in the Guide to Disposal of Chemically Stabilized and Solidified Waste (SW-872).

Any on-site construction of a RCRA facility may not be possible due to the present siting criteria which restricts construction due to site characterization. High hazard and unstable terrain, and ground water monitoribility, are two items that have not been fully addressed.

Cover

The strip mine operation and deep mining of coal both contribute to undermine the foundations that would be necessary for construction of a '264' landfill. Clearly, the technical standards could not be met because of subsidence potential which effects the integrity of the bottom liner and RCRA cap. In addition, the location of the deep mines have not been identified and superimposed over the strip mined area to clearly delineate areas where subsidence will not occur. As a result, in order to close the facility properly, the cover material must have a permeability less than or equal to the permeability of the natural subsoils present. In 3.3.3, any cap of the areas in question must conform to §264.301. Use of the soil cover must have a permeability less than or equal to the natural subsoil, not the unnatural mine spoil.

Subsidence due to failure of the deep mines must be addressed in the development of the soil caps. Continual maintenance must be required in the event that the subsidence monitoring program that will be developed to identify the occurrence of subsidence shows failure. In the event that the alternative to grout the deep mine is chosen, the areas to be grouted, the methodology and success of the program must be identified prior to implementing the balance of the recommendation.

Conclusion

The recommended actions do not presently comply with the RCRA regulations due to the man-made alterations at the site that limit the alternatives that are presently proposed. The unconsolidated deposits have been extensively altered by strip mining activitiy, which mixed the natural soil, mine spoil, and landfill debris. Above and below the coal seams, rock has been extensively fractured, and in some cases, has subsided due to the deep mining activities in the Diamond, Rock and Big Coal mines. The site's geologic and hydrologic conditions severely limit the Remedial Actions Alternatives available; this is evidenced by Sections 2, 4 and 5 of the Remedial Investigation.

It would appear that alternatives 12 and 13 may be able to meet the provisions of RCRA with additional work being required prior to that determination.

1. Monitoring of ground water in this regime would require a dynamic ground water monitoring program. A dynamic ground water monitoring program must be developed, and evaluated to ensure that it has a high degree of success, prior to any alternative implementation.

2. Determination of the limits of contamination must be completed. A vertical and horizontal limit of excavation must exist in order to determine the extent of excavation to allow for clean closure with no ground water monitoring.

3. Subsidence is a major concern at this site. This may be addressed through successfully grouting the deep mines, developing a monitoring and maintenance program to determine the degree of subsidence and projected repair and maintenance to the RCRA cover and ground water and subsidence monitoring systems.

Taylor Borough Responsiveness Summary
June, 1985

Located in Taylor Borough, Lackawanna County, Pennsylvania, the Taylor Borough Superfund Site is an abandoned municipal landfill situated in a reclaimed strip mined area. The site extends several miles northeast-southwest along Bald Mountain, a wooded ridge used for hunting and other recreational activities. Approximately 1,000 residents live within a one mile radius of the site. A recreational area, known as McDade Park, borders the site to the northeast, and a residential development borders the south end of the site. Land surrounding the site is used mostly for recreational and residential purposes. McDade Park is maintained by Lackawanna County and contains a small museum, a swimming pool, and several picnic areas. The Taylor Boro site is part of the Lackawanna River Valley, large portions of which are reclaimed strip mines now experiencing residential and light industrial development.

In the early 1980's, the surrounding community became highly interested in the Taylor Borough Site. The area surrounding the site contains several landfills located in Taylor Borough, and in the adjoining town of Old Forge. Three of the landfills are on the Superfund List. The Taylor community is very concerned about the impact that these sites will have on their health, environment, and future generations. As a result of the number of landfills and Superfund Sites in their area, the Taylor Borough residents want a health study performed in Lackawanna County. This has been a continuing concern of the residents, since the Pennsylvania Department of Environmental Resources performed the site's first investigation in June, 1981.

In May 1982, EPA began a Field Investigation at the Taylor Borough Site. At that time a group of citizens who lived closest to the site formed the Taylor Neighborhood Association. The Hazardous Ranking Score (HRS) for the site did not make it eligible for inclusion on the National Priorities List in July, 1982. The group urged other Taylor residents to send letters to EPA Headquarters in Washington, DC, requesting that the site be re-evaluated. After additional documentation from PADER indicating larger quantities of potentially hazardous substances have been dumped at the site, the HRS score was revised. In August, 1983, a brush fire occurred at the Taylor Borough Site. The spilled contents of some of the drums onsite burned, and local officials received numerous calls from residents complaining of dizziness, severe headaches, and skin and eye irritation. The Taylor Borough Site was placed on the National Priorities List in September 1983.

In November 1983, 1200 drums and their contents were removed from the site, under an immediate removal action. In addition to the drum removal, security gates were erected at the site access roads to prevent vehicular traffic from entering the site. However, the site is still accessible by foot or cycle. In March, 1984, a remedial investigation began at the site.

The citizen's group keeps in contact with the EPA Regional Office and has requested copies of EPA documents for the Taylor Site. EPA responded to this request by sending copies of the RI/FS reports to the group, and also a copy to the Borough Administrator, on May 21, 1985. The official repository is at the Taylor Borough Hall. In addition to the RI/FS reports, sample results during the remedial investigation were shown to the Taylor Neighborhood Association and to local officials.

In an effort to elicit citizen input during the remedial investigation stage of the project, the EPA Community Relations Coordinator and the Remedial Project Manager met with local citizens in their homes to answer questions and to review and explain sample results. This opportunity was also extended to the Borough Administrator. When the local officials were questioned by residents about the progress of work at the site, EPA was contacted and the local officials received a complete update. Each time, before work began at the site, EPA contacted the Chairperson of the Taylor Neighborhood Association and the local officials, in an effort to keep the community informed. Press interest was not high at the Taylor site, but citizens and the local officials showed a high level of concern during all stages of the project.

On Tuesday, June 4, 1985, a public meeting was held at the Taylor Borough Hall to acquaint the residents with the EPA and PADER recommended clean up alternative for the site. This alternative is the cost-effective and environmentally sound solution, which proposes to:

° Remove and dispose of approximately 125 crushed and intact drums and remnants remaining on the surface or partially buried.

° Drain and treat surface water in ponds 1 and 2 and excavate soil and sediments from former drum storage areas 1 and 2 and both ponds, then properly dispose off site.

° Place a minimum 24 inch soil cover over: (a) drum storage areas 3 and 6 and the entire area in between, and (b) drum storage area 4.

The purpose of the meeting was to provide information to the public concerning field work during the remedial investigation; to inform the public of the various proposed remedial cleanup alternatives; and to afford the public the opportunity to comment on the recommended cleanup alternative.

Public notice of the meeting was made by sending a press release to all newspapers, radio stations and television stations in the Scranton/ Wilkes-Barre area. The Chairperson of the Taylor Neighborhood Association was contacted, as well as the Taylor Borough Administrator. The Remedial Investigation Report and the Feasibility Study were placed in the repository and sent to the citizen group two weeks prior to the public meeting. The public comment period was open until June 14, 1985. About 30 residents and local officials attended the public meeting. One radio station, one television station, and one newspaper was represented at the meeting. The Remedial Project Manager discussed what work was done at the site since March 1984, and then announced the preferred cleanup alternative. Before

the meeting, the site's EPA Community Relations Coordinator distributed fact sheets to the attendees. The fact sheets detailed the history and status of work at the site, and listed the recommended cleanup alternative. Included with the fact sheet were two site maps. The Remedial Project Manager showed slides of the site maps as he described the Remedial Investigation and cleanup alternative.

The Taylor Neighborhood Association, interested residents, representatives of potentially resposible parties, local officials, and EPA and PADER representatives attended the meeting.

EPA has incorporated the comments received from the public during the comment period into the Taylor Borough site Record of Decision. The majority of concerns and comments received by EPA from the community were in favor of having a health study conducted in Lackawanna County. The residents asked that Taylor Borough and neighboring Old Forge Borough be considered for a health study because four Superfund sites exist in the two towns. EPA Community Relations Coordinator contacted the CDC representative who in turn contacted the Pennsylvania Health Department. EPA explained to a resident who called after the meeting that CDC will not do a health study in an area unless the State Health Department requests that such a survey be done. The name and address of a doctor who chairs a state environmental committee was given to the caller. This health study request is the primary concern of the citizens group and other residents in the area.

Another concern is future use of the site. EPA explained that deed restrictions and zoning laws can only be instituted by the local governing body. The landowners can also place deed restrictions on the land.

The citizens accepted our cleanup method, without any objections, but they were concerned about the health and welfare of the residents while work was being conducted onsite. EPA explained that during the design stage of the project, Site Specific Health and Safety Plans will be developed. EPA went on to explain that during the design stage, local fire companies and local and county emergency services will be contacted and updated by EPA and the Army Corps of Engineers. The Coordinator of the Taylor Borough Emergency Management Agency explained that an evacuation plan is already prepared.

Another major concern of the citizens was an unidentifiable odor in a specific area of the Taylor Borough Site. In response, EPA took samples at that location during the Remedial Investigation, and did further test pit investigation in an effort to determine the source of the odor. The area is being addressed in EPA's recommended cleanup alternative, through excavation down to natural soils, and offsite disposal of the contaminated soil. This effort will eliminate contamination and either reduce or eradicate the odor.

The original public comment period for the Taylor feasibility study lasted from May 23 thru June 14, 1985. At the request of the potentially responsible parties, the comment period was extended to June 21, 1985. By June 14, EPA received one comment, from a potentially responsible party. During the week of June 17, EPA received a letter signed by two residents of Taylor Borough, one letter from the Taylor Borough Council, a letter from the Taylor Borough Emergency Management Agency and one letter from a potentially resposible party. The residents had five comments, which were answered as follows:

1. Comment: Land use restrictions should be recorded in the Scranton Courthouse.

Answer: This issue has been addressed in the Record of Decision, under the heading Recommended Alternative. See page 18 in the Record of Decision.

2. Comment: Site monitoring should continue, and results should be made public.

Answer: Under the heading Operations and Maintenance, in the Record of Decision, a minimum of 5 years of surface water and sediment sampling is recommended. Groundwater monitoring requirements will be addressed in a later study. See page 21 in the Record of Decision.

3. Comment: Cover material used during the cleanup project should not be from another dumpsite.

Answer: Fill material will be tested before it is used at the Taylor Site.

4. Comment: Site specific firefighting plans should be developed.

Answer: Taylor Borough Emergency Management Agency is accepting calls regarding specific training for firefighters. The Remedial Project Manager will address this issue and meet with the Borough Agency during the project design stage.

5. Comment: Efforts are continuing to have a health study conducted in Lackawanna County.

Answer: All requests for a health study are being referred to the Pennsylvania State Health Department. In response to this request, a contact name and address has been given to each citizen.

The Taylor Borough Emergency Management Agency commented favorably on the Preferred Remedial Alternative that was announced at the June 4 meeting. They also noted that any questions regarding training for firefighters in the Borough be referred to them.

A site specific evacuation plan for the Taylor Borough Superfund Site has been developed by the Borough Emergency Management Agency. Members of the Agency will meet with EPA personnel and EPA's contractor during the design stage of the project to discuss the Site Specific evacuation plans

The Taylor Borough Council commented in writing on the Feasibility Study. They stated their position that all high concentrations of hazardous substances be thoroughly removed from the site. Council also requested that specific security measures be taken; specifically, fencing each individual area once the cleanup is complete, and erecting warning signs in an effort to keep trespasses from crossing over the areas and possibly destroying the soil cap.

Borough Council also informed EPA that no plans are underway to construct a child's play area adjacent to the site.

Taylor Borough Council is also working to get a health study conducted in Lackawanna County, and has asked EPA for assistance in this matter. EPA sent Council the address and name of a doctor at the Pennsylvania Department of Health, who could present their request to the Department's Environmental Council.

In response to verbal requests from the citizens, EPA will hold a public meeting to discuss details of the cleanup, once the design stage is complete.

Comments by the Potentially Responsible Parties ("PRPs")

PRPs submitted written comments on the preferred alternative on three separate occasions. All comments were made through the PRP Steering Committee, which represents several generator companies which EPA has linked to the Taylor Site. The three submissions were as follows:

1) 6-10-85: An initial contemplated alternative in response to EPA's preferred alternative No. 13, in addition to a request to extend the public comment period to July 30, 1985;

2) 6-14-85: Comments on EPA's Draft Remedial Investigation and Feasibility Study ("RI/FS"), including:

   a) The PRP's version of the Hazard Ranking System Score based on the data and ocnclusions of the draft RI and FS reports;

   b) A summary of the activities at the Taylor Borough Site and Analysis of RI/FS findings;

   c) A Summary Table showing raw wastewater toxic pollutants from coal mining operations;

   d) Detailed technical comments on EPA's preferred alternative No. 13; and

3) 6-21-85: Revisions and Supplemental information to the PRP proposed remedial alternative of 6-10-85.

The specific comments of the PRPs will be set forth below, along with EPA's response. Additionally, EPA considered the PRPs request to extend the public comment period to July 30, 1985, and on June 14 we partially granted this request, allowing one additional week of comment period to June 21, 1985. As set forth above, additional PRP comments were received on June 21. EPA believes that an extension beyond this time is not necessary, since the PRPs have been fully involved in all aspects of the on-site Remedial Investigation since March 1984, they received the bulk of the technical data collected concerning the site by March 1985, and their representatives met with EPA in early May 1985 to present information for EPA's inclusion in the Remedial Investigation. The involvement of the PRPs included meetings with EPA in 1984 to critique details of EPA's proposed investigation of the site. In response to these meetings with the PRP's, EPA did make revisions in the planned investigatory work at the site. Based on this extensive participation, EPA believes that it has given the PRPs an adequate opportunity to review information concerning the site, and to present comments to EPA. Nevertheless, we did allow them an additional week in the event they had comments beyond their detailed submission of June 14.

Comment #1: Remaining materials in Drum Area Nos. 1 and 2 are not hazardous wastes. Test pit logs indicate they are primarily a mixture of garbage, soils, mining overburden and miscellaneous rubble and construction debris (typical of a sanitary landfill). (from 6-21-85 letter)

Answer: EPA agrees that the remaining materials are not hazardous wastes. However, the materials contain elevated levels of hazardous substances, sufficient to cause a concern for the protection of human health and the environment. For example, commonly used industrial solvents such as ethylbenzene, toluene, xylene and 4-methyl-2-pentanone, as well as polynuclear aromatic hydrocarbons and PCB-1254 were found in former drum storage areas Nos. 1 and 2 (see page 5 of the Record of Decision for a full discussion; also see table 3-6 of the Remedial Invetigation). As such, it is necessary to take appropriate remedial measures to ensure that these materials do not pose unwarranted risks to human health and the environment. EPA's guidance for the remediation of CERCLA sites states that in determining site clean-up measures, applicable and relevant provisions of other environmental laws should be considered and followed. EPA has thus determined that the regulations promulgated under the the Resource Conservation and Recovery Act, specifically 40 C.F.R. Part 264, subparts F and G (ground water monitoring and closure), are relevant to the remediation of the Taylor Borough site. Therefore, although there may be no hazardous wastes at the Taylor Site, the RCRA standards are relevant and provide helpful guidance in determining appropriate measures for the remediation of the Site.

The fact that the hazardous substances were found intermixed with garbage is not controlling. Hazardous substances that are not typical of municipal waste were found in drums areas No. 1 and 2, such as the chemicals described in the previous paragraph. Additionally, it is uncontroverted that there were drums of industrial waste which had been located at these areas, and that some of these drums were deteriorated and could have leaked, both on the surface and into the garbage layer. It is unfortunate that industrial waste was disposed on top of a municipal landfill, and has complicated both the study and remediation of this site. However, EPA must evaluate and address the site as we found it, and simply treat the existence of the municipal landfill as a unique feature of this site, just as other CERCLA sites have other unique features which are similarly complicating.

Comment #2: Test pit data shows only isolated evidence of hazardous substances and does not support a 4200 cubic yard removal (letter of 6-21-85).

Answer: The test pits were intended to be just that - - an indication of contamination throughout the site. More extensive sampling to chemically characterize every few feet of the site would be prohibitively expensive, based on an average of $1,000/sample.

It was EPA's intention while conducting the test pit program at the former drum storage areas not only to identify the nature of hazardous substances were causing the persistent odors in these areas but also to define the vertical and areal extent of the waste in these areas. Although detected hazardous substances may be attributable to mine spoil and/or municipal trash as well as industrial disposal, the PRP proposal has not established that by removing 1000 cubic yards of waste material the remaining waste is at background levels, in order to meet the requirements of RCRA. Test pit data does show hazardous substances. Any contaminated materials above background left onsite would require the site to be properly closed as a land disposal facility for hazardous wastes, according to the RCRA requirements.

The remainder of this comment is discussed in the answer to comment #19, below.

Comment #3: The potential for direct contact can be totally eliminated by cutting the high wall to a 3:1 slope and applying a geotextile material and cover. This will also eliminate the potential for any odors emanating from the area and is more cost-effective.

Answer: EPA does not believe that these steps will eliminate the chemical odors or potential odors from this area. The odors are tentatively identified as toluene, but methylene chloride and 4-methyl-2-pentanone have also been identified in this area Firstly, geotextile material is very permeable, and would not prevent the chemical odors from being released. Mining overburden provides relatively little protection against the release of chemical odors. The 6" of topsoil would also be insufficient to prevent the odors from escaping. Even the addition of more topsoil would not necessarily be effective to control the chemical emissions. EPA's Feasibility Study Guidance states that impermeable material should be used as a cover in any event, which would mean the installation of a clay cap. Then, in order to ensure the integrity of the clay cap, it would be necessary to grout the mine voids to prevent potential subsidence of the cap (see comment #7, below) Grouting would cost an estimated $2.2 million, with the total cost for installation of the clay cap then reaching an estimated $2.7 million. This alternative would therefore not be cost-effective.

Comment #4: The PRP Plan adequately addresses stormwater control, by eliminating the pond Nos. 1 and 2 depressions and providing stable cover and preventing erosion of the cover and safely directing stormwater from the area.

Answer: Without going into a detailed discussion of the technical merits of this proposal, several problems arise which prevent the PRPs alternative from being implemented at the site. The major feature of the PRPs alternative is that it would leave elevated levels of hazardous substances at the site, whereas EPA's alternative would not. However, in order to leave these materials on-site and still protect human health and the environment it would be necessary to have a rigorous monitoring program to ensure that the hazardous substances were not being continually released into the environment. The PRP proposal does not include such a monitoring program. Additionally, RCRA closure standards would have to be followed. Both of these measures would be extremely expensive. In view of this as well as other factors, EPA has concluded that the preferred alternative is to remove the threat of release by removing the materials from the site.

Comment #5: Pond Nos. 1 and 2 sediments contain no elevated inorganics and minimal levels of organics. Pond water (to be removed) shows slight contamination, much less than typical urban stormwater run-off. (letter of 6-21-85)

Answer: The chemical makeup of urban stormwater run-off is irrelevant to this site. It is not disputed that the Taylor Site is not located in an urban area, but rather in a remote rural setting. The remainder of this comment is discussed in the answer to comment #4, above. Of note, the PRPs comment recognizes that there are elevated levels of organics found in these areas.

Comment #6: The singular risk, direct contact, is cost effectively eliminated by leaving the sediments in place and providing a stable cover. (letter of 6-21-85)

Answer: As discussed in the answer to comment #4, above, the PRPs have failed to include the costs of RCRA closure and monitoring in their cost assessment for this proposal. This would significantly impact their cost-effectiveness determination. Such closure and monitoring would be necessary to ensure that contaminants from the site were not released into the environment. EPA's selected alternative eliminates the risk that these substances can be released into the environment from this site.

Comment #7: Such ditches at shallow grades are difficult to maintain and tend to promote further depressions and subsidence in old landfills when not maintained. (letter of 6-21-85)

Answer: The PRPs comment is referring to their preference for substituting two percent grading at the site for EPA's alternative, which includes the installation of ditches to direct ground water flows. EPA agrees that there is a possibility of subsidence and further depressions at the Taylor site, particularly since the site is

located over a mined area where subsidence is common. In fact, this is one of the reasons why EPA's selected alternative includes removal of the hazardous substances from the Taylor site -- maintenance of the landfill could prove to be difficult, and if hazardous substances are left at the site, future direct contact with the substances cannot be ruled out.

However, EPA does not necessarily disagree with the PRPs approach of using a two percent grade rather than the ditches. This is a fairly minor comment, and adjustments in this type of work can be made during the design phase of the remedial project.

Comment #8: The adjacent property owner has placed a large mound of fill material along the property line which would make placement of drainage ways difficult. (letter of 6-21-85)

Answer: EPA does not necessarily disagree with this comment. Similar to comment #7, this point can be addressed during the design phase.

Comment #9: The drainage basin areas are small. (letter of 6-21-85)

Answer: EPA does not necessarily disagree with this comment. This point can also be addressed during the design phase.

Comment #10: The Hazard Ranking Score calculated for the Taylor Site is arbitrary, inaccurate and too high, and has caused public misconceptions about the site.

Answer: The initial ranking of this site in the summer of 1982 caused public concern because it was felt to be too low (see Responsiveness Summary, p. 1). The Taylor Neighborhood Association petitioned EPA Headquarters to reevaluate the score, based on the public's serious concerns about the site. On the basis of additional collected information about the site, the site was rescored in 1983, resulting in its current EPA scoring of 30.94. Thus, the EPA scoring has not caused public misconceptions; rather, the public has been active in pushing EPA to address the site.

It is possible that different consultants scoring the site will come up with slightly different scores, and EPA does not maintain that the PRP's consultant, Hart, is not qualified. Additionally, it is not feasible to address a detailed comparison of scores in this summary response. Suffice to say that EPA's formulation of the score was based on reliable data and information concerning the site, and the PRPs have not taken issue with this data. Thus, there is no reason for EPA's formulation to be questioned.

The PRPs must also recognize that are errors in their analysis of the information in their formulation of the HRS score. Without going into a detailed review of all of these areas, one obvious example is the PRPs erroneous formulation of the total waste at the site. In that formulation, the PRPs have subtracted from the waste total the approximately 1200 drums which EPA removed during the emergency activities in 1983. But this approach only encourages PRPs to take "band-aid" measures at CERCLA sites, so as to lower the score and remove the site from the NPL. The remainder of the problems at the sites would then never be addressed! For this reason, EPA has established clear guidance stating that partial clean-up measures at sites will not be taken into account in HRS formulations. This sound policy approach ensures that environmental and health hazards posed by these sites will be fully addressed. Thus, in the HRS formulation of the score by the PRPs, the waste quantity has been calculated erroneously.

Another error of note is the PRPs characterization of air emissions. In their HRS formulation, they state that "No air contamination detected throughout RI activities. 1200 drums have been removed from site. Previous air contamination was probably due to presence of drums containing hazardous materials." (PRP worksheet, p. 11). This is clearly inaccurate. The person preparing the worksheet for the PRPs has obviously not visited the site recently, because if (s)he did, (s)he would observe that there still is a clear chemical odor emanating from former drum storage areas Nos. 1 and 2, and the adjacent ponds Nos. 1 and 2 (referred to by field investigators as "Shoe Polish Pond"). EPA has been unable to quantify or definitively characterize this odor, although field investigators identified it as toluene, perhaps combined with other organics. This error by the PRPs has resulted in their calculation of an inaccurate score for the site.

Comment #11: In selecting a remedial alternative, EPA must abide by the restrictions of CERCLA and the NCP taking into account actual site conditions. The Selected Remedial Alternative does not conform to the legal and regulatory constraints imposed on EPA. . . . Alternative 13 contains many aspects that are unnecessary given the present condition of the Taylor Site. (submission of 6-14-85, p. 9)

Answer: EPA agrees with the PRPs that clean-up actions must conform to CERCLA and the NCP. In support of their assertion, the PRPs have cited a number of selected portions of the NCP and of CERCLA. A detailed review of all of these provisions would be exhaustive, and is beyond the intended scope of this Responsiveness Summary. However, the PRPs have cited only selected portions of NCP. EPA's actions must be

guided by the entire NCP, not just selected portions. Additionally, EPA's actions must be guided by relevant guidance, including our policy of compliance with applicable and relevant environmental laws. One of those laws is the Resource Conservation and Recovery Act ("RCRA"). EPA determined that the standards of RCRA are relevant to the Taylor Site, particularly since the RCRA standards are the only detailed guidelines the agency has for handling hazardous materials. Further, the Subtitle C portion of RCRA was determined to be the relevant portion of RCRA to apply, since it is undisputed that industrial wastes as well as municipal wastes were disposed at the Taylor Site (see answer to comment #1, above).

For these reasons, EPA believes that it has correctly applied CERCLA and the NCP in the determination of the appropriate clean-up at the Taylor site.

Comment #12: Background conditions at the site should reflect previous site activities (municipal landfill and mining). The PRPs should not now be called upon to address the contamination that did not originate from the disposal of hazardous substances, if any. (Submission of 6-14-85, Appendix B, p. 3).

Answer: This comment has substantial merit, and EPA has taken background conditions of the site into account in the Remedial Investigation (Section 3) and in the selection of the remedy (Record of Decision, pp. 4-5). EPA's overriding concern in the remediation of this site is the adequate protection of human health and the environment from exposure to hazardous substances, and as discussed in comment #1, above, the existence of the municipal landfill and the mining is a complicating factor in differentiating the source(s) of the hazardous substances. It is difficult to see how the PRPs can contest the disposal of industrial wastes at the site, in view of over 1000 drums at the site which the PRP's own representatives saw and sampled. Thus, EPA believes that it has taken these considerations into account in the selection of the remedy.

Comment #13: Present site conditions pose no significant potential for airborne contamination, either from organic vapors or dust.

Answer: See EPA's answer to PRP comment #10.

Comment #14: . . . There is neither an appreciable public health or environmental risk posed by contaminated soils remaining on the site. Localized areas of elevated contaminants in the soils can be appropriately addressed in a remedial action program for the site.

Answer: EPA agrees that there is not a serious public health or environmental risk posed by the contaminated soils; however there is still an appreciable risk. The contaminants of concern are primarily volatile organics typical of industrial solvents, and lead, well-known for its adverse health effects particularly in children.

Thus, EPA agrees that localized areas of elevated contaminants in the soils can be appropriately addressed in the remedial action program for the site, and we believe that we have appropriately addressed these with the selection of our alternative #13.

Comment #15: . . . Contamination [of surface water and sediments] is limited to the areas of Pond Nos. 1 and 2. . . . there is no evidence of off-site migration of these contaminants and no evidence of exposure pathways for those contaminants within the Pond Nos. 1 and 2 area.

Answer: This comment indicates that the commenter recognizes that contamination in Pond Nos. 1 and 2 was found. As such, it must be considered for remedial action. Even if there were no evidence of off-site migration, this is not necessarily controlling since this was not extensively studied. EPA considered the data discussed by the PRPs in comment #15, and reached the conclusion that the contaminated materials must be removed from the site primarily to prevent human exposure, and also to comply with the guidance of the RCRA standards. In order to comply with the RCRA regulations, the contaminated materials must be: (1) removed to background levels, or (2) if above background material is left on site then the area must be closed as an existing land disposal unit which requires (a) a RCRA approved cover, (b) ground water monitoring of the unit, and (c) post closure maintenance of both the unit and monitoring program. The alternative of leaving these contaminated waters and sediments on site would have to incorporate such additional measures, which also have their associated costs. The PRPs do propose an alternative which would leave the sediments on site, but it does not address these RCRA points.

Comment #16: Groundwater contamination is minimal.

Answer: EPA agrees with this comment, but also notes that groundwater contamination was found, in well #3C, including the contaminants 1,4-dichlorobenzene, 2,4-dinitrotoluene, and N-nitrosodi-n-propylamine (see page 6 of the Record of Decision).

Comment #17: There are no potential receptors of contaminants.

Answer: EPA disagrees with this comment. The site is adjacent to a recreational area and a housing development. Picnickers and children have been observed at the site, as well as individuals gathering wild fruit. All of these people are potential receptors of contaminants.

Comment #18: In summary, the RI has conclusively demonstrated that minimal risk to the public health and the environment exists from either air or groundwater routes of exposure. Moreover, the RI indicates that for the most part, surface water, soils and sediments show contaminant patterns consistent with background levels found in the area or levels which are attributable to sanitary landfill and/or mining activities. Several localized areas showing elevated surface soil, surface water and sediment contamination levels have been identified and only these limited areas need be addressed at all, and if so, in a cost-effective manner to minimize dermal contact.

Answer: EPA believes that it has adequately addressed this comment in the Record of Decision and in its previous answers to the PRPs comments. Further, the PRPs must consider the pathways of ingestion or inhalation of the contaminants in addition to the dermal contact route.

Comment #19: Alternative 13 includes components which go beyond that which is required to meet this objective without any supporting analysis or rationale . . . [such as]:

- methane gas venting,
- extent of soil cover,
- off-site disposal of contaminated soil and sediment, and
- ground water monitoring.

Answer: EPA will first address the specific criticisms made by the PRPs, and then will generally discuss their alternate proposal.

Methane gas venting: EPA agrees with the PRPs that methane gas venting may not be necessary. Thus, the preferred alternative has been revised to allow for a determination during the design phase of the project whether the methane system is warranted.

Extent of soil cover: As discussed in the answer to comment #18, above, inhalation and ingestion must also be considered as exposure routes. This is of particular note in the case of lead, which exhibits elevated levels in the areas of the site designated for the cover by EPA. Additionally, the toxicological recommendation for this site was to minimize the translocation of these surface contaminants, in order to adequately protect human health. These are reasons why EPA has concluded that a surface cover on selected portions of the site is necessary.

Off-site disposal of contaminated soil and sediment: Although it may be preferable to use an alternative that does not involve off-site disposal, both on-site treatment or disposal are not feasible alternatives for this site. The PRPs have not identified what would be a feasible "treatment" for the wastes at this site, and on-site disposal is prohibitive because of the location of the site in a mine subsidence area. In order to ensure the integrity of an on-site disposal option, it would be necessary to grout the mine voids, an extremely difficult and costly task (approximately $5.7 million). Thus, off-site disposal at a site effectively monitored for release of wastes is preferable, both as a matter of environmental and health protection and of cost.

Ground water monitoring: This comment has merit. EPA has revised the preferred alternative to postpone consideration of the groundwater issue. Thus, the present alternative does not include a long-term groundwater monitoring program.

Other concerns EPA has with the PRP's proposal are as follows:

In comparing remedies for the former drum storage areas Nos. 1 and 2, EPA proposes to remove approximately 4,000 cubic yards of hazardous materials while the PRPs propose to remove only 1,000 cubic yards. The major reason for EPA's higher quantity is to prevent the future migration of hazardous substances into the adjacent surface water (ponds 1 and 2 and possibly St. John's Creek and also eliminate the persistent chemical odor emanating from this area. By removing the contaminated soil/spoil/garbage/rubble/ crushed drums/construction debris material to sub-soil

(which was approximated by a testpit program to be about 8 feet below the surface) the potential for future washout and migration of hazardous substances will be effectively mitigated. Excavating only 1000 cubic yards of exposed wastes and drums currently on the sideslopes of the former drum storage areas Nos. 1 and 2 to an approximate 3:1 grade (as the PRPs propose) may not be an effective source control measure. Additionally, removing only the exposed wastes and drums on the sideslopes of the former drum storage areas, grading and backfilling with permeable material may not adequately eliminate the persistent chemical odor emanating from former drum storage areas Nos. 1 and 2 and Ponds 1 and 2.

The PRP's proposed remedy for addressing the above-background surface soil contamination at former drum storage areas 3, 4 and 6 and the area in between areas 3 and 6 closely resembles the EPA selected remedial measure for these areas. Because of the RCRA requirements, the cover material must have a permeability less than or equal to the natural subsoils present. Using mining overburden material for fill material in depressions as the PRPs propose would be acceptable; however, the final cover would need to be constructed of soil material with a similar or less permeable property than natural subsoils.

Further, in order to ensure the integrity and effectiveness of the soil covered waste management areas, EPA recommends the installation of a chain link fence for protection of the covered area from vehicle damage. Although the PRPs intend to institute a post-closure inspection and restoration program, the frequency of one inspection per year is not acceptable. The likelihood that minibikes may damage the soil cover is a strong possibility at this site. More importantly, should settlement or subsidence occur, restoration of the soil cover should be taken care of as soon as feasibly possible.

As discussed previously, since above background levels of contamination would be left under the soil cover, compliance with 40 C.F.R. § 264.310 would be required, which specifically requires a post closure ground water monitoring program. Again, the PRPs did not address the development of this program.

As a final point, there was no mention of removing the remaining crushed and intact drums and remnants scattered throughout the surface of the site and partially buried. The PRP proposal is incomplete without this and the required RCRA elements.

Comment #20: The PRPs letter of 6-10-85 is also included in the public comments for the Taylor site.

Answer: This letter is more in the nature of a proposal, and does not detail specific comments about EPA's preferred alternative for the site. However, a number of the PRP comments and answers set forth above address the issues raised in this proposal. EPA believes that this is adequate to respond to the comments contained within the proposal.